Merthyr Tydfil Urban District Council.

ANNUAL ∴ REPORT

OF THE

MEDICAL OFFICER OF HEALTH,

FOR THE YEAR 1903.

By D. J. THOMAS.

MERTHYR TYDFIL:
JOSEPH WILLIAMS AND SONS, "TYST" OFFICE, AND 88 HIGH STREET.

1904.

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ANNUAL REPORT

OF THE

MEDICAL OFFICER OF HEALTH

FOR THE

Urban District of Merthyr Tydfil,

FOR THE YEAR 1903.

Town Hall,
Merthyr Tydfil,
April, 1904.

To The Chairman and Members of the Merthyr Tydfil Urban District Council.

Gentlemen,—

I have the honour to present the Council with a Report on the Sanitary condition of the District, together with the vital and other statistics for the year 1903.

The Report has been so arranged so as to comply, as far as possible, with the recommendations issued by the Local Government Board:—

"Every Medical Officer of Health, appointed under order of the Local Government Board, is required to make an annual report with regard to each Sanitary District which is under his superintendence. This report is to be for the year ending 31st of December, and is to be made to the Council by whom he is appointed. The Medical Officer of Health himself should send a copy of it to the Local Government Board, and to the County Council within which his district may be situated.

"The report should deal with the extent, distribution, and causes of disease within the district; and should give an account of any noteworthy outbreaks of epidemic diseases during the year under review, stating the results of his investigations into their origin and propagation, and the steps taken by him, or on his advice, to check their spread. As these reports are for the information of the Local Government Board and of the County Council, as well as of the Council of the District, a statement of the local circumstances and a history of local sanitary questions, which may seem superfluous for the latter, may often be needed by the former bodies.

"Section 132 of the Factory and Workshops Act, 1901, requires that the Medical Officer of Health of every District Council shall, in his annual report to them, report specifically on the administration of this Act in workshops and workplaces; and he shall send a copy of his annual report, or so much of it as deals with this subject, to the Secretary of State."

It is a matter of congratulation that the year has been a remarkably healthy one. The death-rate was the lowest on record for the district. The infantile mortality was also lower than it has been during the past 15 years.

Scarlet Fever was prevalent throughout the year, and a severe outbreak of Typhoid Fever occurred in the autumn. All the other Zymotic diseases showed a diminished prevalence.

During the year new Bye-laws were framed in respect to:—

(*a*) Tents, Vans, and Sheds, sanctioned February 4th.
(*b*) Scavenging, Cleansing of Footways and Pavements, sanctioned April 1st.
(*c*) Nuisances, sanctioned May 20th.
(*d*) New Streets and Buildings, sanctioned July 15th.

Population.

In previous reports it has been explained that the method by which the Registrar General estimates the population is based on the assumption that the average rate of increase which prevailed in the last completed intercensal period was maintained up to the middle of the year under consideration.

If there had been neither emigration nor immigration, the exact population could be ascertained. In an industrial district, these two causes must affect the population, but no information is obtainable as to the extent of this effect. The natural increase during the year was 1,392; *i.e.*, the number of births exceeded the number of deaths by that figure. The enumerated population at the Census was 69,228. From the date of the Census to the middle of the year 1903, the number of births registered exceeded the number of deaths by 2,549. If the disturbing factors above mentioned had not been in operation, the natural increase would have raised the population to 71,777. This figure closely corresponds to the Registrar General's estimate, which is placed at 71,651.

Judging from the number of new houses completed and occupied in 1903, it is probable that the last decennial rate of increase was more than maintained during the year. There was an increase of 2,944 occupied and inhabited houses between 1891 and 1901, and if that rate had been maintained, 348 new houses should have been built in 1903. Apart from houses re-built, 341 certificates were issued by the Building Inspector, and 83 houses were built by the Council. From this number should be deducted 4 houses closed during the year. This would leave a net increase of 420.

It is understood that the above remarks simply apply to the rate of increase since the Census, and they have no reference to the enumerated figures at the Census, and the method adopted by the Registrar General applies only to the total population.

If the method be applied to the two registration districts, and to the six Wards, the result will not coincide, as the decennial increase was unevenly distributed. In the one case the estimate would be 71,406, and in the other 71,906.

It is desirable and important that the statistics should be subjected to as minute an analysis as possible, if we are to ascertain the results obtained, and in what direction progress has been made during the year. It is only by such means that the actual influence of sanitation on the public health can be measured. Fortunately this year, one is in a better position than usual to accomplish this, as an enumeration of the inhabited houses was made for the purpose of the re-division of the Parish into Wards.

With the co-operation of the Assistant Overseer, the following figures have been obtained, and they represent a fairly correct estimate of the population of the registration districts and of each ward :—

	Population.
Upper Registration District	31,571
Lower ,, ,, ...	40,080
Dowlais Ward	12,686
Penydarren Ward	15,505
Cyfarthfa ,, ...	8,978
Town ,, ...	12,181
Plymouth ,, ...	8,754
Merthyr Vale Ward	13,547

There are two other sets of figures, the importance of which it would be difficult to estimate. Apart from sanitation, the mortality varies at different age-periods, and the death-rate among males is higher than among females. A high birth-rate may for a time raise the crude death-rate, as under such circumstances there might be a high percentage of the population living at an age-period when the mortality is always great. Similarly, a district containing a large proportion of old people would naturally have a high death-rate.

A fairly correct estimate of the number living under one year of age can be obtained by calculating the number of births in the latter half of the preceding year and the former half of the current year, and deducting the number of deaths under 12 months during the same period. The other numbers have been estimated from the figures supplied in the Census returns, and are approximately correct. Subject to this caution, the figures may be taken as fairly accurate, as there is no reason to assume that the age constitution has changed materially since the Census was taken. The same remark holds true of the sex-distribution.

Age-Distribution of the Population.

Under 1 year.	1 to 5 years.	5 to 15 years.	5 to 25 years.	25 to 45 years.	45 to 65 years.	Over 65 years.
2,376	7,175	15,353	14,099	20,928	9,565	2,155

Sex-Distribution.

Males.	Females.
38,338	33,313

Births.

	1903	1902	1901	Average 10 years 1893—1902
Number Registered ..	2752	2797	2689	2504
Rate per 1000 Inhabitants	38·4	39·6	38·6	37·9
Rate per 1000 Inhabitants in England and Wales	28·4	28·5	28·6	29·9
Rate per 1000 Inhabitants in 76 Large Towns	29·7	30		

The number of births registered during the year was 2,752—1,389 males and 1,363 females. The births were distributed as follows:—

	Total	Males	Females
Upper Registration District ..	1205	607	598
Lower ,, ,, ..	1547	782	765

This number corresponds to a birth-rate of 38·4 per 1,000 inhabitants, which is 3 per cent. lower than that of 1902, and

1·3 per cent. higher than the mean rate for the 10 years 1893—1902.

The birth rate is 35 per cent. higher than that of the whole of England and Wales, and 29 per cent. higher than it is in the 76 large towns. Two of the large towns had a higher birth-rate—Rhondda 41·1, and St. Helens 38·8.

On Table I, the birth-rate for the last 10 years is given, and it will be observed that it continues to be uniformly high, and does not show signs of diminution. The year 1895 was an exceptional year, and the only period within the last quarter of a century when the birth rate exceeded 40 per 1,000. Since, the rate has fluctuated between 34·9 in 1899 and 39·6 in 1902, and though in 1903 there is a slight decrease as compared with the 3 years 1900—1902, yet for the year it is above the decennial average. This is contrary to the experience of the whole of England and Wales, where the birth-rate has shown a tendency to decline since 1876, and since 1895 this decrease has been continuous.

It is sometimes contended, and rightly so, that it is unfair to institute comparisons, if the rate is simply calculated as a ratio of the births to the total number of inhabitants.

We may calculate the rate as a ratio of the births to:—

(a) The number of females living between the ages of 15 and 45.

(b) The number of married women living at the same ages.

By the former method the rate would be 180 per 1,000, or over 40 per cent. higher than the birth-rate calculated on the same ratio throughout the whole of England and Wales.

The figures obtained by this method are not affected by the varying proportions of illegitimate births in different districts, but these variations are not enough to invalidate the figures obtained by the second method. The latter method introduces the least number of factors which might vitiate the results. The proportion of births to every 1,000 married women under 45 years of age in Merthyr Tydfil during 1903 was 308, or over 26 per cent. higher than throughout the whole of England and Wales.

Whichever method is adopted, it will be observed that the birth-rate is abnormally high; in fact, calculated by the latter method, Merthyr Tydfil had the highest birth-rate in the kingdom, both in 1901 and 1902.

The birth-rate shows but little tendency to be affected by season, but the number registered during the first half of the year was slightly in excess of that in the latter half; the maximum occurred during March and April, and the minimum in June, July, and October. Neither is there an appreciable difference between the two registration districts; in the Upper it was 38·1, and in the Lower 38·6.

The infants registered as having been born out of wedlock number 81, which corresponds to a rate of 29·4 per 1,000 births, or 1·1 per 1,000 living. This is in excess of the two previous years, 25·1 in 1902 and 25·6 in 1901, but lower than the illegitimate birth-rate throughout the kingdom, which averages 40 per 1,000 births. In the Upper registration district it was 21·5, and in the Lower 35·5.

Deaths.

	1903	1902	1901	Mean 10 years 1893—1902
Number	1360	1622	1795	1549
Rate per 1,000	18·98	22·96	25·85	23·4
Rate per 1,000 in England and Wales..	15·4	16·3	16·9	17·6
Rate per 1,000 in the 76 Large Towns..	16·3	17·4		

The total number of deaths registered in the district was 1,390, but there are two public institutions in the parish that receive inmates from the outlying districts, and where there are hospitals, workhouses, or other public institutions having a proportion of their inmates drawn from outside districts, the Registrar General directs that the deaths of persons not belonging to the district should be deducted from the total.

The Union Workhouse is situated within the area of this district, and serves the parishes of Merthyr, Aberdare, Gelligaer, Rhigos, Vaynor, and Penderyn, and 27 deaths of non-residents occurred in the Infirmary.

It also receives a large number of vagrants, and 22 persons admitted from one or other of the Common Lodging Houses died there. A great majority of these were vagrants, and did not properly belong to the town, yet they are included in the death-returns of the district. Were it not for the presence of the Union Workhouse, these would not have been attracted here. Moreover, if the accommodation were ample, some of these, in accordance with the directions of the Registrar General, would not be included among the returns for the district. To anyone acquainted with the system adopted by the police, this will appear clear. The destitute vagrants apply to the police for a ticket of admission to the Workhouse. If there be accommodation, they are admitted directly, and their usual place of abode is entered, or if they have no place of abode, they are so entered. In such circumstances, their deaths are not included in the returns for the district.

On the other hand, if an application be made for admission to the Workhouse, and there is no accommodation, a ticket is given which entitles the holder to a night's shelter at a Common

Lodging House. If they are admitted from there to the Infirmary, the Common Lodging House is given as their previous address, and, in case of death, they are returned as "residents." This probably accounts for the fact that 22 out of the 92 deaths of "residents" which occurred in the Union Infirmary were admitted thereto from one or other of the Common Lodging Houses.

Altogether 119 deaths occurred in the Union Infirmary. Of these 92 were "residents" and 27 "non-residents."

30 deaths occurred in the General Hospital, 27 residents and 3 non-residents.

20 deaths occurred in the Fever Hospitals ; these were all residents.

The deaths of residents occurring in these institutions have been allotted to their respective wards according to the previous addresses of the deceased as given by the Registrars.

One other correction should be made ; but I have not been successful in obtaining a list of persons belonging to the district who may have died in public institutions situated in other localities.

The only institution wherein deaths occurred, and which would materially affect the returns, is Bridgend Asylum.

After making the corrections above referred to, the total number of deaths registered and belonging to the district is 1,360. This corresponds to a death-rate of 18·98 per 1,000 inhabitants. Compared with previous years, the mortality shows a decided improvement ; it is over 17 per cent. lower than 1902, 23 per cent. lower than 1901, and over 18 per cent. lower than the average rate for the 10 years, 1893—1902.

Since 1841 the death-rate of the district has been continuously kept, and the figures for 1903 are the lowest on record. In no other year has it been below 20 per 1,000, and only in six instances has it been below 21. In 1902 the district possessed the unenviable reputation of having the highest death-rate among the 76 large towns, and, with one exception, it had also the highest infantile mortality. Last year 9 of the large towns had a higher death-rate, and 31 had a higher infantile mortality.

In comparison with the figures prevailing in the district in years past, the statistics are gratifying ; but it would be unfair to leave out of consideration some factors which detract somewhat from the merit attached to the figures. The mortality throughout the kingdom has shown a steady decline for years past, and in 1903 the death-rate was the lowest on record ; so that, in spite of the reduction here, the death-rate is still 16 per cent. higher than that of the 76 large towns.

The mortality is excessive in two of the diseases, Diphtheria and Fever, which are usually taken as a test of salubrity, as the following table shows.

Death-rates per 1,000 inhabitants from various diseases in 1903 :—

	All Causes.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhœa.	Infantile Mortality
76 Large Towns ...	16·3	·03	·36	·14	·20	·33	·12	·71	144
Merthyr Tydfil ...	18·9	...	·46	·4	·35	·42	·4	·6	155

In 6 of the Zymotic Diseases the death-rate is higher than that of the 76 large towns, but the excessive rate from Measles and Whooping Cough is wholly explainable by the high birth-rate, and consequently a larger proportion of persons living at an age-period peculiarly liable to these diseases; but the mortality from Scarlet Fever, Diphtheria, and Fever cannot be entirely due to such a cause.

The climate of the past year was most favourable, and in this respect it does not readily admit of a fair comparison. Strange though it may seem, a wet summer is one of the greatest boons which a sanitary authority can desire. The effect on the infantile mortality of the heavy rainfall experienced during the summer months was incalculable. This is referred to later on, and there can be no doubt that the diminution noticed is partly explained by the climatic conditions which prevailed during the third quarter of the year. A reduction in the prevalence of air-borne diseases would naturally be expected as a result of the physical consequences of the heavy rainfall ; but, contrary to experience, with the exception of Typhoid Fever, there was a diminished mortality from diseases which are dependent on a rise of the soil water and an increase of surface moisture, such as Diphtheria, Phthisis, and Respiratory Diseases. In 1903 the deaths from Phthisis numbered 61, and from other Diseases of the Lungs 267, as compared with 91 and 382 respectively in 1902, and 92 and 433 in 1901.

Any baneful effects which an excessive moisture of the air may have had on these latter diseases were more than counterbalanced by the mildness of the weather during the winter months. The first and fourth quarters of the year were characterised by a fairly equable climate, with a temperature above the average.

It has been suggested that a wet year may have an unfavourable effect upon the statistics of the succeeding year, and it is of interest to note that the death-rate here, for the first quarter of 1904, was more than 35 per cent. higher than that of the corresponding quarter of 1903.

Age-Incidence.

The following table gives the death-rate per 1,000 persons living at each age-period :—

Under 1 year.	1 to 5 years.	5 to 15 years.	15 to 25 years.	25 to 45 years.	45 to 65 years.	Over 65 years.
177	26·9	3·7	4·4	8·1	28·2	85

The death-rate reaches its minimum at the age-period 10 to 15 years, and from that age it steadily increases. The greatest tendency to death is among infants. Expressed as percentages of the total deaths, 31 per cent. occurred under 1 year, 14·2 between ages of 1 and 5 years, 4·2 between 5 and 15, 4·7 between 15 and 25, 12·5 between 25 and 45, 19·8 between 45 and 65, and 13·6 at an age over 65 years.

Sex Distribution.

741 of the deaths were of males, and 619 of females.

The death-rate among the former was 19·3 per 1,000 living, and among the latter 18·5. Throughout the kingdom the difference in the mortality among the two sexes is more marked than that observed here, amounting, as a rule, to about 2 per 1,000.

Ward Distribution.

	Dowlais.	Peny-darren.	Cyf-arthfa.	Town.	Ply-mouth.	Merthyr Vale.
Number ...	261	298	194	214	148	245
Death-rate ...	20·6	19·2	21·6	17·6	16·9	18

The distribution is referred to in more detail on pages 52—57.

Uncertified Deaths.

·4 per cent. of the deaths were uncertified.

Zymotic Diseases.

Deaths ... 189 Death-rate ... 2·6

The so-called Zymotic death-rate includes deaths from seven Zymotic Diseases, namely, Small-pox, Measles, Whooping Cough, Scarlet Fever, Diphtheria, "Fever," and Diarrhœa. In some quarters it still retains its popularity as an index of the sanitation of a district, but its importance depends solely on the relative prevalence and mortality of the seven diseases. An epidemic of Measles or Whooping Cough may affect the magnitude of the Zymotic death-rate more profoundly than an excessive prevalence of Diphtheria, Enteric Fever, or Diarrhœa, though the former diseases are but little dependent on sanitary conditions. Moreover, some other preventable diseases, such as Phthisis and Puerperal Fever are not included.

To obviate any fallacious conclusions, the diseases have been separately dealt with.

Measles and Whooping Cough.

The number of deaths registered as due to Measles was 33, 19 males and 14 females—the annual average for the decennium 1893—1902 being 41. The mortality for the year corresponds to a rate of ·46 per 1,000 inhabitants.

Whooping Cough was returned as the cause of 30 deaths, 16 males and 14 females.

Measles and Whooping Cough occur frequently in association with each other. There is a difference of opinion as to the order of sequence in which these two diseases occur in respect to each other. Here Whooping Cough appears to have followed measles. The latter disease was prevalent throughout the early part of the year, and reached its maximum in August, but no deaths occurred during the latter five months.

Whooping Cough was more prevalent in the second half of the year. No deaths occurred in January, and the maximum was reached towards the end of the year and in January, 1904.

In January and February Measles appeared in Treharris, and 5 deaths occurred there. In March a few cases occurred in Dowlais; it lingered here during April and May. In June it was prevalent in Gellifaelog, and by July it had travelled to Caepanttywyll.

It was in the latter locality that it assumed its most fatal form, and during July and August it was returned as the cause of 10 deaths in Cyfarthfa.

Whooping Cough, on the other hand, was prevalent in Treharris from May to October; in Dowlais from July to November; and in Penydarren during December, 1903, and January, 1904.

The combined mortality from these two diseases is equal to a rate of over ·87 per 1,000 inhabitants. At first sight, this figure does not appear serious, but it does not represent the full extent of the mischief wrought. 62 of the deaths were of children under 5 years of age, and 35 of these occurred among infants under 12 months old. In other words, among children under 12 months the mortality exceeded 14 per 1,000 living at that period, and 6·5 per 1,000 living under 5 years. In the age-period, 15—45 years, the entire death-rate was 6.6 per 1,000, so that among children under 5, from these two diseases alone, the mortality almost equalled that from all causes among adults.

Unfortunately, the expression, "It is only Measles," is common among many people, and in itself it is not a serious illness; but, unless care be bestowed on the sufferers, a fatal complication, such as Broncho-pneumonia, is liable to set in. They have come to regard it as a very harmless sort of ailment, while Diphtheria and Typhoid Fever are looked upon as terrible diseases; and yet the aggregate loss of life from Measles and

Whooping Cough is far greater than that from all the notifiable diseases combined.

Many districts, and among them are Cardiff, Swansea, and Newport, have appointed Female Health Visitors, and their visits to infected houses will undoubtedly tend to diminish the death-rate from the so-called minor ailments.

Typhus.

One case of Typhus was reported, and from which the patient died.

The case was removed from the Union Infirmary on June 30th, and death took place on the morning following admission to Pant Hospital. He was unconscious prior to his admission to the Infirmary, and remained so up to the end, so that a clear history could not be obtained. As far as could be ascertained, the following are the facts of the case. He was admitted to the Infirmary on June 27th from McGuires' Lodging House in Pondside, but had been ailing for a week. He was a tramp, and had arrived in Merthyr on June 7th. On arrival at the Lodging House he was destitute. He was provided with food and clothing, and found employment at the Cyfarthfa Works. It is not known where he had stayed when on tramp, but evidently he had walked from Glasgow. As the incubation period varies considerably in different cases, it is impossible to state whether he contracted the disease in the district or during the time he was on tramp. As it was the only case reported, it is reasonable to assume that he was infected prior to his arrival here.

Small-Pox.

7 cases of Small-pox were notified, but no deaths resulted from the disease. The 6 cases notified in January were dealt with in the Annual Report for 1902. The seventh case was reported on March 30th, and was removed from Edward Stephen's Terrace, Troedyrhiw. In the first week in March a sister of this patient arrived on a visit from Cardiff. About the middle of March she was taken ill, and a rash appeared on her face and hands.

A doctor was not called in, but the patient notified on March 30th nursed her. The former had recovered, and left the district before March 30th ; but, from the history, there can be no doubt but that she suffered from Small-pox. From inquiries made, she had probably been in contact with persons suffering from the disease at Cardiff. The sister living at Troedyrhiw first exhibited symptoms of the disease on March 26th. She had been vaccinated in infancy.

Typhoid.

	1903	1902	Mean for 10 Years, 1893—1902
Number of Cases notified	294	90	150
Number of Deaths	29	17	18·5
Death-rate per 1,000 living	·4	·24	·28
Death-rate per 1,000 living in England and Wales	·1	·13	·17
Death-rate per 1,000 living in 76 Large Towns	·12	·16	

There is a large increase both in the number of cases notified and in the number of deaths registered. This resulted from a severe outbreak which commenced in September, and continued throughout the three succeeding months. Isolated or sporadic cases had been notified during the earlier part of the year, and, save in March, the district was not free from the disease.

Up to the end of August the number had been below the average, and lower than in the corresponding periods of the four previous years.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Total.
1903	5	4	0	4	4	6	4	13	40
1902	1	1	5	10	6	1	17	9	50
1901	14	2	6	5	12	6	11	10	66
1900	18	18	26	18	26	32	24	36	198
1899	19	10	12	11	27	28	9	25	141

The cases were distributed during the four months, September to December, as follows :—

September.	October.	November.	December.
151	50	27	23

The increase in August was coincident with the general autumnal rise observed yearly throughout the kingdom.

Up to September the disease was most prevalent in Dowlais and Penydarren, but cases had occurred throughout the district, 9 being notified from Dowlais, 15 from Penydarren, 3 from Cyfarthfa, 3 from Town, 1 from the Infirmary, 5 from Plymouth, and 4 from Merthyr Vale. The outbreak assumed epidemic proportions during the first week in September, continued at its height through the month, and gradually subsided during the three following months.

The first portion of this report on Typhoid will deal exclusively with the cases reported in September, as there are strong reasons to believe that this epidemic had its origin in a distinct and separate cause.

Dates of Notification.

Sept.	1	2	Notifications.	Sept.	16	12	Notifications.
,,	2	7	,,	,,	17	4	,,
,,	3	2	,,	,,	18	5	,,
,,	4	2	,,	,,	19	6	,,
,,	5	1	,,	,,	20	7	,,
,,	6	5	,,	,,	21	6	,,
,,	7	0	,,	,,	22	6	,,
,,	8	2	,,	,,	23	8	,,
,,	9	2	,,	,,	24	5	,,
,,	10	5	,,	,,	25	10	,,
,,	11	3	,,	,,	26	5	,,
,,	12	10	,,	,,	27	0	,,
,,	13	7	,,	,,	28	3	,,
,,	14	1	,,	,,	29	8	,,
,,	15	10	,,	,,	30	7	,,

The above simply refer to the dates upon which the notifications were received, and not to the time of the onset of the symptoms.

The first characteristic to be noted was the extensive distribution of the outbreak. With the exception of Treharris, almost every locality in the parish was affected. Cases were notified in Dowlais from Penywern, Pant, Mary Ann Street, and Walter Street; in Penydarren from Erin Row, Sand Street, High Street, Church Street, Plantation Street, Solomon Street, Lewis Street, Tramroadside, Trevethick Street, Penyard, Mountain Hare, and The Quar; in Cyfarthfa from Caepanttywyll, Bryant's Field, Bethesda Street, Georgetown, Heolgerrig, Clwydyfagwyr, and Rhydycar; and in the Town Ward from the Tramroad, Thomastown, Twynyrodyn, Ynysgau, Glebeland, Albert Street, Chapel Street, and Caedraw; in Plymouth from Pentrebach, Abercanaid, Duffryn, and Troedyrhiw. Only one case was reported from the Merthyr Vale Ward, and that occurred in Bell View Terrace.

The outbreak was too extensive in character, too widespread in its distribution, to be accounted for by defective drainage. It was not mainly restricted to neighbourhoods characterised by markedly unhealthy conditions.

There was no exceptional incidence along particular lines of sewers, and no direct relation existed between the occurrence of the outbreak and conditions of drainage. Gross sanitary defects were detected only in a very small minority, and it is now generally taken for granted that the more carefully outbreaks are investigated, the more certainly can defective house-drains be excluded as their immediate cause, though they may influence the distribution of the disease.

In all 129 houses were affected.

As to the sex distribution, there were 72 males and 79 females. Both sexes were equally liable, and the distribution was too even to bear relation to the occupation of the attacked.

Age Distribution.

Under 5	5 to 10 years	10 to 15 years	15 to 20 years	20 to 25 years	25 to 35 years	35 to 45 years	45 to 65 years	Over 65 years
8	21	24	25	19	28	11	9	6

The greatest susceptibility is usually observed between the ages of 15 and 35, so that here the incidence was abnormally heavy between the ages of 5 and 15.

No age-period was exempt, and the cause evidently was one that operated on all ages.

The extensive distribution of the disease throughout the district, together with the sex and age incidence, suggested some article of food as the probable vehicle of infection.

All the houses were supplied with water from the Council's mains. This water is periodically analysed, and the results of recent analyses were uniformly good. Inquiries were also made at the Reservoir houses, and at the farms above the Pentwyn intake, but no history of a recent illness was obtainable.

The milk supply was drawn from 64 different sources. Condensed milk alone was used in 12 houses.

1	milkvendor	supplied	12	houses.	
1	,,	,,	6	,,	
2	milkvendors	,,	5	,,	each
2	,,	,,	4	,,	,,
6	,,	,,	3	,,	,,
12	,,	,,	2	,,	,,
39	,,	,,	1	,,	,,

It may be concluded that the outbreak could not be traced to milk. It did not display the usual characteristics of an extensive milk-borne outbreak, as in such circumstances there is a preponderance of females and children among the attacked. With one exception, the milk was obtained in the immediate neighbourhood.

The premises of the milkvendor were visited, and inquiries made as to any cases of illness, &c., on the premises or among the employees.

The other food-supply to which attention would naturally be directed was shell-fish. This article of food has been known to act as the carrier of pathological micro-organisms, and many outbreaks of Typhoid Fever have conclusively been traced to the consumption of specifically contaminated shell-fish. Often though, Typhoid Fever has been attributed to these, for no stronger reason than that the patient had consumed oysters, or cockles or mussels some time before the illness commenced, and a certain amount of caution is necessary ere we accept as proof the connection between the shell-fish and the outbreak.

Of the total number notified in September, 13 were secondary cases, that is, occurred in houses from which a previous case had been notified. These in all probability were infected through contact, either directly or indirectly. 7 other cases were known to have been in contact with a previous case. These "contact" cases will be referred to later as one of the factors in the spread of the disease.

In 8 instances the poison was probably contracted elsewhere, in 3 there could be no doubt of this.

1. D.J. had been to Llanstephan from August 5th to the 27th, and was taken ill on September 6th.

2. T.G. had stayed at Goodwick from the 8th to the 29th of August, and was taken ill on August 30th.

3. A.L. was visiting some friends at the Mumbles, from the 25th to the 31st of August. She had partaken of oysters there on the 29th, and was taken ill about September 7th.

4 and 5. H.R. and T.B. had been staying at Porthcawl for a couple of weeks, and were taken ill a week after their return.

The above dates are highly suggestive that the 5 were probably infected prior to their return.

6. I.J. was notified on September 20th. He came to the district from Penygraig on September 15th, and first exhibited symptoms of the disease on the following day.

7. G.R. was a native of Aberdare. The notification was received on September 16th. He had been here for a week, and was ill on arrival.

8. H.E. had been at Mountain Ash for a month, was suffering from a "cold" when she returned, and which subsequently developed into Typhoid Fever.

There remained 123 cases.

It was found that 84 of these had partaken of cockles or mussels about a fortnight before the onset of symptons. This figure refers merely to those who could definitely remember the fact, but it probably underestimates the actual number, as, in many instances, owing to a late diagnosis of the illness, inquiries were delayed until a period of 5 or 6 weeks had elapsed, and a large number of people cannot tax their memory sufficiently so as to bring to mind such a trivial event as the consumption of a few cockles.

In an industrial district these figures are not in themselves conclusive, as workmen are most partial to this form of food. But when the result of our inquiries came to be analysed, it was found that no less than 76 of the persons attacked obtained their shell-fish from one source, and on the same date, August 15th. The dates upon which the notifications were received are unimportant, as the time that elapsed between the onset of symptoms and the date of notification varied. As far as could be ascertained the following table gives the date upon which the initial symptons appeared :—

August	28th	1 patient.
,,	29th	2 patients.
,,	30th	13 ,,
,,	31st	24 ,,
September	1st	14 ,,
,,	2nd	7 ,,
,,	3rd	3 ,,
,,	4th	2 ,,
,,	5th	1 patient.
,,	6th	2 patients.

In 7 instances definite information as to onset could not be obtained; it was vaguely given as somewhere between September 5th and 15th.

The peculiarly insidious mode of onset makes an exact determination of the date impossible; taking also into consideration the variability of the incubation period it is possible, and even probable, that all these cases were infected at the same time.

As a rule the incubation period is about 14 days, so that the infection probably occurred about the middle of August, and coincides with the date upon which the shell-fish were eaten.

Two samples of the suspected cockles and mussels were taken for bacteriological examination—one from the beds or gathering ground, and the other at the house where they were retailed.

Both were found to be contaminated, but this important point has to be noticed, that the pollution of the retail sample was much greater than in the case of those collected at the source.

There was no evidence of pollution during transit, so that the further contamination must have occurred after arrival in Merthyr. It may be mentioned that inquiries were made at the village near which the beds were situated, but no cases of Typhoid Fever had occurred there recently. The result of the bacteriological examination by Dr. Scholberg, of the County Laboratory, will be found at the end of this report, but the following extract will suffice to demonstrate the extent of the pollution: "On September 14th, 1903, a number of cockles and mussels, collected in a sterile bottle (at Merthyr Tydfil), was received for examination, with special reference to their pollution by excrementitious material, and, if possible, for the isolation of the specific organism of Typhoid Fever. Evidence of the former was readily obtained, but of the latter, the results were uncertain. So far the question of the presence of the Bacillus Typhosus must be answered in the negative. The facts brought out by the bacteriological examination show that the cockles and mussels have been exposed to conditions which allow of serious contamination with human matter of excremental origin. The conclusion is quite clear, that the sample of shell-fish submitted for examination is not of such a character as to be fit for human consumption."

The bacteriological examination is not in itself conclusive as to the cause of the outbreak. But the conditions that existed in the middle of September were different to those prevailing in the middle of August. The person suspected to be the source of infection was removed to the Hospital on September 3rd, suffering from Typhoid Fever, and therefore could not affect the nature of the pollution on September 14th. The bacteriological examination proves though, that in their storage, the shell-fish were liable to contamination, and the further facts of the case will show that, on August 15th, there was in the house from which they were retailed, a source whereby specific contamination could have occurred.

I. P., of A. Street, had one consignment of cockles and mussels a week. The cockles were "shelled" at the seaside, and in that form they were popularly known as *rhython*. All the "cooking" took place at the source, and as various experiments have conclusively proved, the process of "steaming," as it is called, is utterly insufficient to kill any harmful microrganisms which they may contain. In the Annual Report of the Local Government Board for 1900-01, are given some experiments which were carried out under conditions almost identical with the process of cooking which the cockles and mussels sold here underwent. Samples were placed for 48 hours in tanks containing Typhoid-infected sea-water. They were then taken out, and, after being washed and brushed, were placed in a heap in a shallow-basin, and boiling water poured over each collection of shell-fish. It was found that in this procedure the temperature of the water used fell to 63 c. in five minutes; and that while the shell-fish on the outer part of the heap opened and became coagulated immediately, those at the bottom of the heap took over five minutes. They were then washed and drained, and cultures made from their interior (stomach and alimentary canal). From the bottom layer the Typhoid Bacilli were readily obtained.

These experiments are quoted simply to show that the mere pouring of boiling water over cockles and mussels need not destroy the infection contained in them, and that the *rhython* sold here, should they have been collected from a typhoid-polluted source, are not free from danger. Here, there is further evidence to show that the specific contamination occurred after their arrival at Merthyr. After this process of "cooking," they were sent in sacks, and arrived here on a Thursday evening.

They were cleaned on a Friday, and sold in the Market on a Saturday. The cleaning solely consisted in washing out the brine. This was attained by putting them in wicker baskets, which were then placed in large tubs under the water tap. The water was allowed to run for some time, and the cockles were occasionally stirred with the hand. They were taken to the Market in wooden pails, and consumed on the premises from little porcelain dishes. Formerly, the cleansing was entirely done in the Market; and if it had continued so, possibly the particular consignment that caused the mischief would not have been contaminated. Now, the whole process is carried on in the house; and on this occasion this was the rule observed.

On September 4th, J. P., of A. Street, was notified as suffering from Typhoid Fever. The history he gave of his illness was fairly definite.

He had been confined to his bed since August 21st, but had been ill then for 8 or 9 days, suffering from diarrhœa, so that his illness really dated from August 12th or 13th.

On August 13th a consignment of cockles and mussels arrived at the house. On the following day, they underwent the usual process of washing and cleaning, and on August 15th they were sold in the Market. The cleaning was mostly done by the wife, but, as the husband informed me, on that date (August 14th) he assisted.

All the 76 person referred to above bought the cockles and mussels on August 15th ; and a reference to the date of onset of their symptoms makes it extremely probable that that was the day upon which they were infected. It is difficult to ascertain the true history in many instances, and the figures given refer only to those who distinctly recollect to have partaken of these shell-fish on that particular date.

The source from which J. P. was infected remains obscure; but the nature of his occupation makes it difficult to obtain reliable information as to his movements. He was employed on the railway, and may have been infected somewhere outside the district.

There was no doubt as to the nature of his illness, and he succumbed to Typhoid Fever on September 25th.

I have entered into the details of the outbreak, so as to bring into consideration all the other factors which usually operate in the causation of Typhoid Fever, and any doubtful cases have been eliminated. Briefly, the following are the facts upon which the opinion of specific contamination is based.

1. 76 persons partook of cockles and mussels on August 15th. The shell-fish were obtained from one source, and this article of food was the only factor common to all the cases.

2. All the patients exhibited symptoms of Typhoid Fever within a period of 12-22 days after the consumption.

3. The shell-fish were shown to be open to pollution during their storage.

4. There was a case of Typhoid Fever in the house of the retail dealer on August 15th, and the sufferer handled the shell-fish on the 14th.

On these grounds, I think, the assumption is fairly justified that the source of the infection can be traced to the consumption of the shell-fish.

Eight other persons were known to have eaten cockles about a fortnight previous to the onset of symptoms, but the evidence regarding the share of the shell-fish in the causation of the disease was not conclusive. Typhoid Fever can only arise from a pre-existing case; and this link was absent in the history of the eight. There is one other circumstance which negatives the idea of specific pollution in the latter cases. The cockles were bought in their shells, and boiled at the homes of the patients. When properly cooked in this manner, no sufficient evidence has yet been advanced that they can cause Typhoid Fever.

In October a limited outbreak occurred, which was probably caused by an infected milk supply. The milk was open to pollution from two sources, and there is a certain amount of doubt as to the actual means by which it got infected.

Four cases were notified from Dowlais on October 11th, 14th, and 17th. One other patient contracted the disease here, but developed symptoms after his departure from the district.

From inquiries made, it was ascertained that the dates of the onset of symptoms were October 1st, 3rd, and 7th, so that all the cases may have been infected at the same time.

The four occurred in separate houses, three of which are in close proximity to each other, but the fourth was situated at a distance of about half-a-mile from the others.

The only common factor was the milk-supply. The vendor on the dates of notification (October 11th to 17th) lived at a farm, B, but had only recently moved there. Up to October another family occupied the farmhouse, and the milkseller resided in W. Street. But, though he resided in W. Street, the handling of the milk, during the whole of the summer, was almost entirely done at B; the cans after use were first washed in hot water at W. Street, but were then taken to B, and there kept immersed in cold water.

The water supply of the house in W. Street was derived from the Council's main, and the infection probably occurred at B.

The question of contamination from the main sewer can be at once dismissed from consideration. It is true that the sewer into which the drainage of Pant Hospital is emptied runs along the lower boundary of the farmyard, but it is a recently constructed one, and, if it were defective, this could not affect the water supply, as the farmyard is much higher than the level of the sewer, and the water is obtained from a still higher point.

The water supply of B is collected from the surface of a cultivated field situated some distance above and beyond the house.

This field is surface drained, and the water collects at its southern end, and is carried by means of a stone culvert for a distance of about 200 yards. The culvert is covered over by rough stone slabs, and traverses by the side of a path, which, until it was recently closed, was frequently used as a short cut to the Bryniau Road. The culvert opens out at a point about 100 yayds above B, and the water, for the remaining distance, is conveyed to the farmyard by means of iron pipes. Alongside the path, and at the point where the culvert opens out, the water was only partially protected, and there can be no doubt as to the possibility of its contamination here by excrement, and evidence of this was present in October.

The suspected milk probably became infected about the middle of September, and, if this water was the ultimate source of the mischief, one would expect the sequence of events which generally follow where a supply is only partially protected.

In such circumstances we usually find that the pollution takes place on a wet day following a period of dry weather; this simply means that the rain washes down any filth which may have been deposited on the surface in the immediate vicinity. These conditions were fulfilled in this instance. Between September 13th and 18th no rain fell; on the 19th ·02 inch of rain was recorded; on the 21st ·04 inch; on the 23rd ·17 inch; and on the 24th 1·02 inch.

A patient suffering from Typhoid Fever was removed to the Hospital on October 2nd, and who had been ailing since September 16th. Between September 13th and 18th she went along the above-mentioned path daily, and remembers having been there after the onset of the symptoms of Typhoid Fever.

I have mentioned this possible source of infection, as, on the face of it, the theory appears to be tenable, and even now it would be incorrect to state that it is impossible for this to have been the inciting cause. Means have been taken to further protect the water supply, though the weight of evidence does not point to it as the probable source of infection. If it were, one would expect a more extensive outbreak. The distribution of the disease was limited to four, whilst the vendor delivered milk at 110 houses. Moreover, up to September 25th, the house at B was occupied by a family, consisting of husband, wife, and five children.

No illness resembling Typhoid Fever had occurred among them, and, if the water had been specifically contaminated, some member of his family would probably have suffered.

There remained one other source from which the milk at B could be infected. For the purposes of his business, the vendor obtained an additional supply of milk from two other farms, P and C. The milk from P was free from suspicion.

The occupiers of C kept one cow, which supplied milk for the household ; the remainder was sold to the tenant of B.

On September 19th the occupier of C was notified as suffering from Typhoid Fever, to which he succumbed on September 23rd. He had been ill since September 4th.

It is almost certain that the four cases were infected between the 4th and the 23rd of September, and if the pollution was a transient one, it probably occurred between September 16th and 23rd. Prior to September 19th, when a definite diagnosis was arrived at, no precautions were taken ; even subsequent to this date a certain amount of carelessness was exhibited. Although at first denied, it was afterwards admitted, that the cow was milked in the byre, and the milk brought into the house. It is known that some articles of food are extremely sensitive to infection, and milk is probably one of the easiest to become contaminated. The contamination may have been slight, but a few bacilli introduced into milk would find in it such a suitable medium for growth, that in 24 hours it would be highly infective without in any way having its appearance changed.

It is admitted that the milk of B could be infected through two routes, the water supply and the milk from C. In both circumstances the pollution would probably be a transient one; but the limited extent of the outbreak is more satisfactorily explained by the latter theory. One churn alone would be infected, and the fact that but one member of each family suffered is accounted for by the relative susceptibility of different individuals to infection.

It may be a matter of comment that both these outbreaks had their source in a case of Typhoid Fever which had not been recognised as such at the time of infection. To anyone acquainted with the vagaries of the disease, this will not appear very surprising.

Many cases were admitted into the Hospital which exhibited hardly any clinical symptoms of the disease, but were diagnosed by the aid of a bacteriological examination. This was in some instances confirmed by the occurrence of a second case arising from contact with the first ; but at the time, apart from the agglutinative test, it would have been almost impossible, on account of the mildness of the symptoms, to have arrived at a correct diagnosis ; and in this connection, I think, it is only due that I should acknowledge our indebtedness to the County Laboratory for the ready and valuable assistance which it has always rendered, not only throughout this outbreak, but in all circumstances. It is unfortunate that its work is not better known, and its aid is not more frequently invoked, though recently a general tendency is exhibited to take advantage of its assistance in order to arrive at an earlier diagnosis in doubtful cases of Typhoid Fever, Diphtheria, and Phthisis.

There is one other factor which largely influences the spread of the disease. Personal contact with a previous case accounts for a large number of notifications. It is generally assumed that Typhoid Fever is very little infectious, if at all.

This is true in the sense that it is not infectious as Typhus or Scarlet Fever are. The bacillus of Typhoid is capable of a saprophytic existence in food and, probably, in soil and dust.

The organism is passed in the fæces and urine, finds its way into some article of food, and thus becomes the source of infection.

In the course of an inquiry into one case, the mother remarked that she knew how her child became infected. She had been to a neighbour's house, where there was a case of Typhoid Fever. She had assisted the patient with the bed-pan ; but as the assistance was of the slightest, she had taken no precautions to disinfect her hands, or even to wash them. She went back to her own house, and cut some bread and butter for her own child. About a fortnight later this child was down with the disease. Here, the path of infection was tolerably clear ; but, as a rule, the history is not so definite. The following instances, though, will make it evident that personal contact does play a large part in the spread of the disease.

The first group of cases represents its spread among persons who were related to each other by family ties ; and the second where the disease was not limited to one family, but also affected neighbours who had visited infected households.

Case 1. M. T., of 10 U. R., was notified on September 15th.

Case 2. M. T., of the same address, and mother of Case 1, was notified on October 3rd.

Case 3. M. J.. of 56 B. Street, sister of No. 2, was notified on October 13th.

Case 4. S. T., of 10 U. R., daughter of No. 2, was notified on December 3rd.

Cases 1, 2, and 4 were removed to the Hospital ; Case 3 was nursed at home.

Case 1 was nursed by No. 2 up to the time of her removal to Hospital. No. 2 was nursed by No. 3, under similar circumstances.

Case 4 was back and fore at 56 B. Street, during the whole time No. 3 was ill, and had most of her meals there. It is not difficult to surmise how all these got infected. Nos. 2 and 3 were nursing a patient, and at the same time attending to the household duties; in the preparation of the food, they, in some way, infected it.

The following three occurred among members of the same family, all living in the same street, but not in the same house.

D. E. lived at 22 T. Street, and was notified on September 10th. His brother, S. E., and his sister, H. R., both living at 43 T. Street, were notified on September 22nd, and October 8th, respectively.

M. S. and G. S., both of 1 J. Cottages, were notified on September 1st. On September 26th, their cousin, K. S., of 33 P. Street, was notified as suffering from the same disease; she had been to see the patients at 1 J. Cottages.

On September 2nd, C. J., 2 J. Street, was notified. She was nursed by her mother, E. P., who was notified on September 21st.

E. P. was nursed by a daughter-in-law, who lived at 13 T. Street. She was notified on November 4th. A son of E. P., living with his parents at 2 J. Street, was also notified on October 14th.

Case 1. M. D., of 105 I Street, was notified on November 2nd.

At the commencement of her illness, she was nursed by her neighbours, L. P., of 104 I. Street, and M. W., of 106 I. Street.

Cases 2, 3, and 4. On November 28th, S. J. and E. J., sons of L. J., of 104 I. Street, and M. W., of 106 I. Street, were notified.

Case 5. On December 9th, L. J., mentioned above, was notified.

Case 6. J. H., of 92 V. Street, nephew of L. J., was notified.

He had been visiting his aunt on several occasions, and had had some of his meals there.

Case 7. C. W., I. Street, father of M. W., was removed to the Hospital on December 14th.

F. Row consists of 12 houses, situated along the Glamorganshire Canal Bank. It is difficult of access, and the cases reported were nursed at their own homes.

Towards the end of 1902, a case of Typhoid Fever occurred at No. 2. On January 15th, 1903, two cases were reported from No. 1.

On February 16th, a case occurred at No. 11; and on February 7th, another one was notified from No. 1. I visited the place on several occasions, and each time found neighbours in the infected houses.

At the Health Committee in October, a report was presented on a group of 7 cases that were notified from E. Row, Dowlais.

The dates of notification were July 13th, August 17th and 23rd, September 11th, October 6th, 16th, and 17th. This court consists of 10 back-to-back houses, 6 on one side, and 4 on the other.

Although the dates and the circumstances were strongly suggestive of personal contact as the cause, there may have been other factors operating here; the infection may have attached itself to dust, and conveyed through some article of food into the body. It is more probable though, that, in the majority of the instances given, personal contact was the mode by which the infection was conveyed, and they emphasize the extreme difficulty of limiting the spread of the disease when the patients are nursed in their own homes, and where trained and skilled nurses cannot be engaged.

This conclusion is partly borne by the house distribution of the disease.

From	169	houses	1	Notification	was received.
,,	31	,,	2	Notifications	were received.
,,	13	,,	3	,,	,, ,,
,,	4	,,	4	,,	,, ,,
,,	1	house	5	,,	,, ,,

Three cases were also removed from the Union Infirmary.

Sex Distribution.

Of the attacked, 155 were males, and 134 were females.

The ratio of attacked to the total number of each sex in the entire population was almost equal—4 per 1,000, but the disease was nearly twice as fatal in men as in women.

Altogether 29 deaths were registered—20 males and 9 females. This corresponds to a case mortality of 10 per cent., but in males this amounted to nearly 13 per cent.; whilst in females less than 7 per cent. of the cases proved fatal.

This is contrary to the general behaviour of the disease; it is stated that, as a rule, the mortality in women is greater than in men.

Age Distribution.

	Under 5.	5—10.	10—15.	15—25.	25—35.	35—45.	45—55.	55—65.
Notifications ..	18	48	41	80	65	23	16	3
Deaths	3	0	1	6	10	4	4	1
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Mortality ..	16·6	0	2·4	7·5	15·4	17·4	25	33·3

After the fortieth year the disease always runs a less favourable course, due largely to the frequency of fatal complication, but in children the mortality is usually much lower than was here experienced.

Diphtheria (including Membraneous Croup).

Age Incidence.

	Under 1.	1 to 5.	5 to 10.	10 to 15.	15 to 25.	25 to 35.
Notifications ..	3	38	36	17	10	4
Deaths	2	15	7	1	..	..
	Per cent.	Per cent.	Per cent.	Per cent.		
Mortality	66	39	19	6	..	..

Ward Distribution.

	Dowlais.	Penydarren.	Cyfarthfa.	Town.	Plymouth.	Merthyr Vale.
Notifications ..	29	35	3	8	5	30
Deaths	5	12	1	2	1	4

There is a slight diminution as compared with the two preceding years, both in the number of notifications and deaths.

There was a large increase in the Merthyr Vale Ward.

Seven cases were notified from Edwardsville, 5 from the same house; 5 other cases occurred in one house at Treharris. Altogether 8 cases were notified from Treharris, and 13 from Craigberthlwyd, with two deaths—both in the latter place. The other two notifications were from Aberfan. There was a decrease in all the other wards, but, as in previous years, Penydarren still heads the list.

Ten cases occurred in Gellifaelog, and, whenever the disease makes its appearance in any portion of Dowlais or Penydarren, it is almost certain to crop up in Gas Row or Sand Street.

Six cases occurred in the same house in Tudor Street, and here we had an illustration of the risks as well as the advantages which accrue from the prophylactic use of antitoxin. The primary case was a severe one, but the others were extremely mild in character. The poison may have entered prior to the injection, and the modification in the symptoms thus accounted for. On the other hand, as it is not known how long the protection lasts, the infection may have taken place after the effects of the antitoxin had worn away, and in the circumstances the disease again would probably be mild. Fortunately, the doctor in attendance here was fully aware of the risks to others attendant on the procedure; but, where absolute isolation cannot be enforced, it is possible for those thus protected to act as carriers of the germs, although they themselves may not exhibit any clinical symptoms of the disease.

Georgetown was entirely free from the disease.

It was equally distributed among the two sexes, but the case mortality was much higher in males; 16 deaths were of males, and 9 of females.

Scarlet Fever.

Age Incidence

	Under 1.	1—5.	5—10.	10—15.	15—25.	25—35.	35—45.	Total.
Notifications ..	9	222	257	71	34	16	5	614
Deaths ..	2	18	7	1	1	..	..	29
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Mortality ..	22	8	2·7	1·4	3	..	..	4

Sex Distribution.

		Males.		Females.
Notifications	..	287	..	327

Ward Distribution.

	Dowlais.	Penydarren.	Cyfarthfa.	Town.	Plymouth.	Merthyr Vale.
Notifications	30	87	65	184	110	138
Deaths ..	4	4	2	6	7	6

The notifications correspond to a rate of 8·5 per 1,000 living, and the deaths to a rate of ·4 per 1,000; but 78 per cent. of the notifications, and 86 per cent. of the deaths were of children between the ages of 1 and 10 years. If the notifications and deaths of children between 1 and 10 years were calculated as ratios to the total number living at that age period, the former amounted to 30 per 1,000, and the latter to 1·6 per 1,000.

It was most prevalent during the last quarter of the year.

During the first quarter, 76 notifications were received, and the incidence of the disease was heaviest in Merthyr Vale, Pentrebach, and Penydarren.

There was a large increase in the second quarter, 157 notifications being received. The increase was most marked in Merthyr Vale and Pentrebach, but the disease almost entirely disappeared from the upper portion of Penydarren. Fresh foci appeared in Treharris, Troedyrhiw, Caeharris, and Twynyrodyn.

There was a slight decrease in the number notified during the third quarter, from 157 to 140. The diminution was due to the subsidence of the outbreak in Merthyr Vale and Pentrebach; Troedyrhiw and Twynyrodyn showed a slight increase.

There was again a marked increase during the fourth quarter; 40 per cent. of the cases notified during the year occurred in October, November, and December; 59 cases were notified from Twynyrodyn, 12 from Tramroad, and 10 from Caedraw.

The extreme ends of the parish, Treharris and Dowlais, were comparatively free; but in the 1901 outbreak, these were the localities that suffered most severely. With the assistance of the School Board Authorities, the following figures are given, which show the relative incidence of the disease among those attending the various schools. The figures represent the ratio of attacked to the maximum number on the School Register.

Three Department Schools.

(BOYS, GIRLS, AND INFANTS.)

Twynyrodyn	9	per cent.
St. David's	4·5	,,
St. Mary's	4	,,
Craigberthlwyd	4	,,
Aberfan	4	,,
Pentrebach	3·8	,,
Merthyr Vale	3·3	,,
Georgetown	2·6	,,
Abermorlais	2·5	,,
Abercanaid	2·4	,,
Penydarren	2	,,
Treharris	1·3	,,
Clwydyfagwyr and Dowlais	1	,,
Heolgerrig and Gellifaelog	·7	,,
St. Illtyd's and Pant	·5	,,

INFANTS.

Caedraw	11	per cent.
Brecon Road	6	,,

Caedraw Infants' and Twynyrodyn schools were closed from December 11th to January 4th, for the Christmas holidays.

Ignorant as we are of the factors which operate in the production and spread of Scarlet Fever, it is impossible to state definitely what influence was exerted by our inability to receive any cases into the Hospital during some periods of the year. Owing to the prevalence of Small-pox, no cases of Scarlet Fever were admitted to the Hospital between October, 1902, and February, 1903; and on account of the epidemic of Typhoid Fever, all the Hospitals were utilized during September and October.

As there were at the Census of 1901 46 one-roomed tenements, and 1356 two-roomed tenements, there can be no doubt that, in a large number of instances, it was impossible to obtain hardly any isolation when the patients are nursed at their homes.

The maximum and minimum did not coincide with the seasonal rise and fall observed throughout the kingdom, and probably this modification in its incidence is partly accounted for by a deficient Hospital accommodation.

Erysipelas.

47 cases were notified, with 1 death.

In 30 instances males were attacked. This preponderance of males is due to the nature of their employment, with its consequent exposure to injuries.

Puerperal Fever.

9 cases of Puerperal Fever were notified, with 5 deaths.

20 other deaths occurred in childbed. The total deaths correspond to a rate of ·4 per 1,000 living. Calculated as a ratio to the births registered, the deaths in childbed represent a rate of 10·5 per 1,000.

Diarrhœal Diseases.

The number of deaths from Diarrhœa was 42, which is equal to a rate of ·6 per 1,000 living. 44 deaths were registered as due to Gastro-enteritis.

Since 1900, when the Royal College of Physicians recommended the adoption of the term "Epidemic Enteritis" as a synonym for Epidemic Diarrhœa, and the disuse in medical certificates of death of such terms as Gastro-enteritis, Nuico-enteritis or Gastric Catarrh, the number registered as due to Diarrhœa has increased, whilst the deaths from Gastro-enteritis have apparently diminished. It would be useless, if a comparison be made, extending over a period of years, to limit it to deaths from Diarrhœa, as a large number of deaths formerly registered as due to Gastro-enteritis would now be certified as Diarrhœa. The deaths from Diarrhœa and Gastro-enteritis last year numbered 86, and of these 51 were of children under 1 year.

The average number of deaths from these two diseases for the 10 years 1893—1902 was 139, and of children under 12 months old 106. The latter figure corresponds to an infantile mortality of 43 per 1,000 births. These figures alone emphasize the fearful mortality caused, but they probably do not show to the full extent the amount of mischief wrought. In spite of the power of rapid recuperation which children possess, a large number of those who recover from the immediate effects of Diarrhœa are so debilitated, that they succumb later to other diseases, such as "Marasmus," Bronchitis, &c. Their influence upon the death-rate of the district is obvious, but it is important to recognise that probably both of them are preventable diseases.

Diarrhœa is included among the principal Zymotic diseases, and, as far back as 1887, Dr. Ballard came to the conclusion that it was caused by a specific germ. Recently, this theory has received confirmation, and it is generally held, that the Bacillus of Shiga is the organism that gives rise to the symptoms of the disease.

Of more importance are the conditions upon which the vital manifestations of the organism are dependent. They are in some way closely associated with season. Over 90 per cent. of the deaths occur during the months, July—October, and nearly 80 per cent. are in children under 12 months old. Their prevalence varies enormously in different years, from 86 deaths in 1903 to 285 in 1899. The following table gives the number of deaths in each year for the period 1894—1903, together with a few details concerning the rainfall.

Deaths from Diarrhœal Diseases.						Rainfall in July—October.	
Year.	Births.	Total Deaths.	Under 1 year.	Under 5 years.	Total Rainfall.	Amount.	No. of days upon which rain fell.
					Ins.	Ins.	Days.
1903	2752	86	51	69	86·1	35·5	92
1902	2797	110	85	99	49·5	14·9	76
1901	2689	181	134	150	54·5	13·1	59
1900	2658	109	73	86	70·0	20·5	63
1899	2357	277	218	257	61·3	16·7	48
1898	2495	150	1105	140	60·8	18·1	59
1897	2471	116	86	109	75·8	22·7	64
1896	2334	118	104	116	55·0	24·5	75
1895	2532	143	116	135	60·8	23·8	66
1894	2303	89	62	83	72·2	21·7	70

Whatever views may be held as to the causation of Diarrhœal Diseases, there can be no doubt as to the beneficial influence of an excessive rainfall. As one would naturally expect, the total amount of yearly rainfall bears no direct relation to the mortality; most of the deaths occur during the months July—October, and the factors entering into their causation would operate most potently during these four months. Their prevalence is more closely related to the number of days upon which rain fell than to the actual amount of rainfall. This will appear clear if we limit our figures to infants under one year, and calculate the ratio of deaths to the number of births registered. This method will also enable us to guage fairly accurately the relative incidence of the diseases.

		July—October.	
		No. of rainy days.	Amount in Ins.
1899	92 deaths per 1000 births	48	16·7
1901	50 ,, ,,	59	13·1
1898	46 ,, ,,	59	18·1
1895	45 ,, ,,	66	23·8
1896	44 ,, ,,	75	24·5
1897	34 ,, ,,	64	22·7
1902	30 ,, ,,	76	14·9
1900	27 ,, ,,	63	20·5
1894	26 ,, ,,	70	21·7
1903	18 ,, ,,	92	35·5

It will be seen that the prevalence varies almost inversely with the number of rainy days. Though this ratio does not work out with mathematical accuracy, it is sufficiently close to justify the assumption that the relation is one of cause and effect.

The factor may be beyond the control of sanitary authority, and probably few would be daring enough to wish for a wet holiday season, but the manner in which it operates should teach us something in the prevention of Diarrhœa. The diminished prevalence is probably not due to the purifying action of rain on the atmosphere, as in such circumstances the amount of rainfall would be the determining influence, though it is well known that a heavy shower in summer has a cleansing effect on the air. It is fortunate that such is not the mode of action, as nature could not be initiated in this respect.

It is now generally held that the prevalence of Diarrhœa is dependent on the state of the soil. It is probable that the microrganism has its habitat in the superficial layers of the soil, where in the form of decaying animal matter it has its pabulum and manufactures its poison.

Though the theory that the maximum mortality from Diarrhœa coincides with the temperature of the earth at different depths is now doubted, very few doubt the intimate association of the disease and conditions of the soil. If we consider the state of the streets and backyards the influence of rainy weather is explained. Organic matter is constantly being deposited on the streets, in dry weather this becomes pulverized and carried in the form of dust into the houses. Rain maintains in a condition of moisture collections of dust and refuse, which in a dry state would be carried by the wind and deposited in food, more especially in milk. To prevent dust, the surface of the street must be kept clean, but in dry weather, unless the road watering be unstinted, more harm than good will accrue, as the dust finds its way into the dwellings. The sweeping should take place while the surface is moist. A more potent factor, probably, is the state of the yards at the rear of dwellings.

There is now no excuse for the accumulation of refuse around houses, as almost every portion of the district is daily scavenged. It is almost impossible though, to prevent the impregnation of the soil with organic matter, unless a portion of the backyard be imperviousy paved. This precaution has long been deemed important, and last year the Council adopted bye-laws, which provide that the owner of every dwelling-house in connection with which there is any yard or open space, shall cause such yard or open space to be imperviously paved with flags or paving bricks laid upon a bed of some suitable material, and so sloped to a properly constructed channel as to carry off all waste water therefrom. In this district, with a large number of old houses and small cottage property, the work can only be gradually carried out.

In addition, a strict supervision of the milk supply is essential, as it is useless to prevent contamination at the consumers houses, if that has already occurred either at the source or during transit.

These factors are under the control of sanitary authorities, but unless a certain amount of intelligence be displayed in the feeding of infants, a high mortality will still result from diseases of the digestive organs.

Tuberculosis.

Deaths	..	..	94.
Death-rate	..	..	1·3 per 1000.

63 deaths were due to Phthisis or Consumption, this number being equal to a rate of ·88 per 1,000 inhabitants.

The death-rate from Phthisis has been showing a steady and continuous decline for years, and in 1903, for the first time, it was below one per thousand living.

Five deaths were registered as due to Tabes Mesenterica, which have been included, as this disease is usually regarded as tuberculous in nature.

Tubercular Meningitis accounted for 13 deaths, and 13 deaths were due to Tubercular Peritonitis and other diseases caused by the Tubercle Bacillus.

Infantile Mortality.

The term Infantile Mortality is used to denote the proportion of deaths under one year in a thousand births. The relative mortality of young children is held to be a fair test of the sanitary condition of a district.

During the year 422 deaths of infants under 12 months old were registered, which number corresponds to an infantile mortality of 153 per 1000 births, or 5·8 per 1000 inhabitants.

193 deaths occurred in the age period one to five years. This number corresponds to a death rate of 26 per 1000 living at that age period, and of 2·6 per 1000 inhabitants. The deaths at these two age periods form a percentage of the total deaths of 31 and 14 respectively.

In 1902 the infantile mortality was 183 per 1000 births, and with one exception it was the highest among the 76 large towns.

The average rate for the 10 years 1893 to 1902, was 217 per 1000 births.

In 1903, the infantile mortality in the whole of England and Wales was 132, in the 76 large towns 144, and in the 75 provincial towns 149 per 1000 births. 31 of the large towns had a higher infantile mortality than this district.

In spite of this gratifying reduction, the mortality in children is still high, more especially when it is borne in mind what a large percentage of the deaths can be considered as preventable, and due either to ignorance or carelessness. Some of the deaths are unavoidable, and due to causes beyond control.

40 deaths were due to premature birth, in eight the cause of death was certified as malformation, and in another eight it was atelectasis. There were only three deaths due to diseases inherited from the parents, but possibly some of the 30 returned as Debility from birth may have been due to some congenital disease. In all these, the factors are certainly independent of sanitary conditions. 70 deaths were due to diseases of the digestive organs, and in addition there were 50 deaths from Marasmus, which, in its primary stages, is essentially dependent on digestive disturbances. It is probably no exaggeration to state that the large majority of these were preventable deaths, and can be ascribed to errors of feeding. The child may have been receiving an abundance of nourishing food, but derived no benefit from it, as it was not a suitable food. The best food is denied the infant, as breast feeding is out of fashion, and that not because of any necessity for the mothers to earn their own livelihood. Unfortunately, in a majority of cases, the substitute to breast feeding is the bottle with a long rubber tube. It is certain that this form of bottle enjoys its popularity on account of the ignorance displayed of its dangers. Mothers imagine that if they wash it in plenty of water that they have managed to clean it ; it cannot be properly cleaned ; the milk collects in the angles and will not be dislodged. If hot water be used, the rubber partially dissolves and forms a surface for the deposit of milk, which after a time becomes sour, and forms a fruitful soil to breed germs. Nothing can be more offensive than the smell of one in a sour and dirty condition. Sometimes it is used because it saves trouble ; there is no necessity to hold the baby or bottle whilst the former is being fed ; he is allowed to suck until the bottle is empty ; the latter is refilled after a most perfunctory

cleansing, and often without even an attempt being made to wash it. This process saves trouble, but it plays havoc with the child's digestive powers.

Diseases of the lungs form another heavy item in the infantile mortality. 29 deaths were due to Bronchitis, and 43 to Pneumonia. More than half the total deaths from these diseases occurred in children under five years of age. Bronchitis and Pneumonia proved fatal to 25 persons between the ages of five and forty-five years, whilst in children under five, they were responsible for 126 deaths.

The absurd form of clothing which leaves so much of the body exposed is accountable for many deaths, but the wilful manner in which the children are taken out late at night is responsible for more. It is no uncommon occurrence for children to be out in the arms of their mothers at ten or eleven o'clock at night. They come out into the cold air from a warm stifling atmosphere, and it is no wonder that the children suffer from respiratory diseases.

52 deaths were due to "Convulsions," but this term does not signify a definite disease, but simply a symptom of different diseases of infant life. The other causes of death are dealt with elsewhere.

As usual, the death-rate among illegitimate children was higher than among those born in wedlock. 81 illegitimate births were registered, and 15 of these died before reaching the age of 12 months, giving among this class of children an infantile mortality of 185 per 1000 births.

Cancer.

The deaths referred to Cancer, or Malignant Disease numbered 33, the average number for the 10 years 1894--1903 being 42. The deaths correspond to a rate of ·46 per 1000 living, which is the lowest since 1893.

Of the above mentioned deaths 28 were attributed to Carcinoma, three to Epithelioma and two to "Malignant Disease," without further discrimination.

The deaths included 20 males and 13 females. As a rule, Cancer here, as elsewhere, is much more fatal among women than men, owing to its tendency to affect the generative and mammary organs of the former sex, but in 1903, the sex distribution was abnormal.

It was fatal among males at the rate of ·5 per 1000 living, and among females at the rate of ·4 per 1000.

The ages of the persons attacked were: under 30 years of age, 2; between 40 and 50 years, 3; 50 to 60, 14; 60 to 65, 8; over 65, 6.

The relative frequency with which the organs are affected is considerably different to that in the rest of the kingdom. Cancer of the breast is comparatively rare, and accounted for only one death. During the last 10 years Cancer of this organ accounted for less than 5 per cent. of the total deaths from malignant disease, whilst throughout the kingdom it amounts to nearly 10 per cent. On the other hand, the incidence of the disease on the alimentary canal is relatively high; in 1903 the mouth was affected in two instances, the gullet in three, the stomach in six, and the bowels in five. The other organs affected were—generative and urinary, seven; liver, three; neck, two; and larynx, one. In three instances the part of the body attacked was not specified.

Inquests.

113 deaths were certified by the Coroner.

A Coroner's jury, as a rule, consider death under two main aspects. They distinguish deaths by disease from deaths as the result of violence or negligence. Under the former head, 34 deaths occurred. As usual, Cardiac Syncope heads the list with 11 deaths. I am unaware of the precise significance of this term, it is probably used when the exact nature of the disease is not known.

"Convulsions" accounted for eight deaths, and three deaths occurred in an epileptic fit. There were two deaths each from "natural causes" and alcoholic poisoning. One death occurred from each of the following causes—Old Age, Congenital Heart Disease, Vomiting, Injudicious Feeding, Rupture of a blood vessel on the lung, Septicæmia, Eclampsia, and Exhaustion.

79 persons met their death through accident or negligence, their mortality being equal to a rate of 1·1 per 1000 living.

The death-rate from violence is more than twice as high as in the rest of the kingdom. This is accounted for almost entirely by the nature of the local industries. 27 persons died as the result of accidents in collieries, and six fatal accidents occurred in the ironworks. 12 other deaths occurred as the result of accidents in the street or in their own homes.

Three children died as the result of the clothes catching fire, and four from scalds. The Coroner has frequently called attention to this form of death, which results from negligence on the part of parents. Small children are left alone in the home, and no attempt made to guard the fire by means of a screen or some other device.

Six deaths resulted from overlaying. In some districts this accident most frequently occurs on a Saturday night, but here two of the deaths occurred on a Sunday night, two on a Thursday, one on a Wednesday, and one on a Friday. Although these deaths cannot be attributed to culpable negligence on the part of the parents, yet it is unfortunate that the custom of allowing infants to share the bed with the parents should prevail.

As one authority puts it—"Far healthier and safer would it be for the children if they were placed in a cot or even a box, if by such means they are kept apart, as they would thus be free from the risk of suffocation."

The deaths of eight men and three women were attributed to suicide. This is a dimunition as compared with 1902, but greatly exceeds the average.

One person was found dead and another man found drowned. It has not been ascertained by what agency they met their death.

One person was suffocated whilst sleeping out on the lime-kilns.

The two other deaths occurred as the result of self neglect, and from the explosion of an oil lamp, respectively.

Isolation Hospitals.

Admissions, &c.

	Remaining in Hospital.		Admitted.	Discharged.	Died.
	Jan. 1st, 1903.	Jan. 1st, 1904.			
Small-pox	20		8	28	
Typhoid Fever	8	26	164	131	15
Scarlet Fever		11	93	80	2
Diphtheria		4	20	16	
Erysipelas		1	4	3	
Typhus			1		1
Other Diseases			2		2
	28	42	292	258	20

RAINFALL.

To the Waterworks Committee.

Gentlemen,—The following Tables give the recorded Rainfall for the year 1903, and also a summary of the records of previous years at your Pentwyn and Neuadd Reservoirs, and in the Taff Fechan Valley, north of the same.

TABLE No. 1.—Gauges established in June, 1887.

PENTWYN RESERVOIR.

Gauge—1120 ft. Above Sea Level.

Month.	Total Depth in inches.	Greatest Fall in 24 hours.		No. of days on which ·01 or more fell.
		Depth.	Date.	
January	10·40	1·63	4th	27
February	6·88	1·36	22nd	22
March	11·15	1·17	17th	30
April	3·09	·80	25th	15
May	5·78	1·08	16th	20
June	2·76	·94	14th	9
July	4·02	1·12	21st	20
August	9·29	1·94	14th	21
September	6·59	1·11	10th	21
October	15·68	1·76	14th	30
November	4·05	1·05	28th	21
December	6·46	1·73	12th	22
Total	86·15			258

LOWER NEUADD RESERVOIR.

Gauge—1,462 ft. Above Sea Level.

Month.	Total Depth in inches.	Greatest Fall in 24 hours.		No. of days on which ·01 or more fell.
		Depth.	Date.	
January	10·84	1·95	4th	25
February	6·24	·99	21st	22
March	11·46	1·40	13th	30
April	3·24	1·08	25th	15
May	6·07	1·19	16th	20
June	3·18	·90	14th	8
July	4·62	1·27	21st	18
August	10·57	1·55	14th	23
September	7·54	1·18	10th	21
October	16·63	1·72	14th	30
November	6·06	1·47	27th	20
December	6·57	1·70	12th	21
Total	93·02			253

TABLE NO. 2.—MONTHLY GAUGES ESTABLISHED IN 1894 AT LOWER NEUADD RESERVOIR AND AT VARIOUS SELECTED SITES NORTH OF THE NEUADD RESERVOIRS.

	No. 2. North of Upper Neuadd Reservoir on West side of River.	No. 3. North of Upper Neuadd on Mountain Slope East side of River.	No. 4. 150 yards East of Lower Neuadd Reservoir	No. 5. North of Upper Neuadd near River on West side.	No. 6. At foot of Brecon Beacons near River on West side.	No. 7. North-West of Upper Neuadd on West side of River.	No. 8. North of Upper Neuadd near River on West side.	No. 9. North of Upper Neuadd on Mountain Slope East side of River.
				TOTAL DEPTH IN INCHES.				
January	13·65	6·95	13·92	16·05	16·65	12·65	14·23	7·80
February	9·45	3·50	9·22	9·54	11·90	8·46	10·03	4·03
March	16·06	9·00	13·92	16·05	17·15	13·50	15·13	9·71
April	3·52	2·96	3·73	3·73	3·60	3·40	3·65	2·71
May	5·88	5·48	6·53	6·00	5·80	5·35	5·73	5·56
June	2·90	2·84	3·21	2·82	2·92	2·40	2·72	2·90
July	5·10	4·10	5·18	5·40	5·00	4·14	5·03	3·18
August	12·00	8·90	11·74	12·50	12·40	11·40	12·40	8·92
September	9·28	6·95	8·45	9·20	8·95	9·00	9·70	7·18
October	19·30	13·11	18·96	20·40	19·50	*18·80+	*18·60+	*18·50+
November	7·00	5·80	6·86	7·60	6·60	6·60	6·90	4·85
December	6·12	5·45	7·39	7·35	6·56	5·70	7·10	5·60
Total	110·26	75·04	109·11	116·64	117·03	101·40+	111·22+	80·94+

NOTE.—*Gauges 7, 8, and 9 were overflowing. Probably one inch should be added to the figures given.

There are nine other Daily Gauges situated at 81 feet apart in a straight line, the direction of which is N.N.E. about 150 yards east of the Lower Neuadd Reservoir, where the minimum and maximum recorded rainfall is 85·15 inches and 104·83 respectively. The lowest register for the year is 75·04 inches for No. 3 Gauge, and the highest is 117·03 inches for No. 6 Gauge, being 56 per cent. more at No. 6 than at No. 3. The heaviest rainfall recorded in 24 hours was 2·05 inches on the 4th January.

The year 1903 has been memorable for heavy and continuous rainfall. In the months of March and October there was only one day without rain, and 20·40 inches was recorded in the latter month at one of the Gauges. Rain fell on 258 days during the year.

The Table No. 3, which follows, will be interesting for comparison between the different years since the rain gauges were established. It is unfortunate that we have no record for 1887, which was an abnormally dry year. The year 1889 was, however, a very dry year, while the last year is the wettest on record. More than twice the rainfall of 1889 fell during last year.

TABLE NO. 3.—YEARLY RAINFALL AT WATERWORKS (TAFF FECHAN VALLEY).

YEAR.	GAUGE AT PENTWYN RESERVOIR.	GAUGES AT LOWER NEUADD RESERVOIR AND AT VARIOUS PLACES IN THE GATHERING AREA FOR THE UPPER NEUADD RESERVOIR.																		YEAR.
		No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.	No. 8.	No. 9.	F	G	H	J	K	L	M	N	O	
		100 yards East of Lower Neuadd Reservoir.	North of Upper Neuadd Reservoir on West side of River.	North of Upper Neuadd on Mountain Slope East side of River.	150 yards East of Lower Neuadd Reservoir.	North of Upper Neuadd near River on West side.	At foot of Brecon Beacons near River on West side.	North-West of Upper Neuadd on West side of River.	North of Upper Neuadd near River on West side.	North of Upper Neuadd on Mountain Slope East side of River.	Gauges 81 feet apart, about 150 yards East of the Lower Neuadd Reservoir, and situated in a straight line, the direction of which is N.N.E. (The old No. 1 Gauge is in this Line).									
	1120 ft. above sea level	1462 ft. above sea level	1993 ft.	1843 ft.	1487 ft.	1515 ft.	2099 ft.	2017 ft.	1723 ft.	1997 ft.	1469 ft.	1477 ft.	1483 ft.	1492 ft.	1496 ft.	1507 ft.	1514 ft.	1518 ft.	1524 ft.	
			ABOVE SEA LEVEL.								ABOVE SEA LEVEL.									
									TOTAL DEPTH		IN INCHES.									
1888	61·90	63·13																		1888
1889	44·06	50·58																		1889
1890	52·34	56·15																		1890
1891	75·56	76·47																		1891
1892	45·96	45·06																		1892
1893	54·98	57·36																		1893
1894	72·24	74·63																		1894
1895	60·89	60·03	69·03	52·96	70·15	74·26	83·65	74·68	79·63	54·22	64·34	68·18	63·47	62·77	58·55	60·15	65·61	65·01	62·77	1895
1896	55·05	56·98	64·19	48·65	65·07	70·58	74·52	70·05	73·34	49·29	60·91	64·70	60·58	58·88	53·59	51·18	58·91	58·26	55·96	1896
1897	75·87	73·78	83·87	57·90	88·10	90·10	101·54	89·27	97·15	61·04	79·71	84·86	79·45	80·43	67·74	71·47	81·47	82·44	77·13	1897
1898	60·89	68·62	79·70	53·81	79·18	82·95	94·31	77·62	87·36	55·31	73·36	77·21	68·98	67·11	53·86	58·92	68·08	68·18	61·25	1898
1899	61·30	64·60	73·26	53·23	73·12	74·18	79·24	70·14	74·45	53·13	70·00	72·36	64·15	62·73	55·28	60·59	66·38	67·23	64·25	1899
1900	70·09	75·73	84·62	62·72	85·96	89·70	98·38	89·05	88·18	69·16	80·73	84·05	68·19	73·25	68·37	70·94	76·84	78·01	73·77	1900
1901	51·50	53·48	61·18	46·85	62·64	66·83	75·96	65·78	66·45	44·86	57·90	61·46	49·47	54·42	51·94	47·13	52·30	48·07	49·73	1901
1902	49·55	53·19	62·67	46·84	60·84	60·99	67·25	55·86	61·69	43·99	56·77	58·44	50·90	54·75	53·47	48·39	53·04	48·12	50·84	1902
1903	86·15	93·02	110·26	75·04	109·11	116 64	117·03	101·40	111·22	80·94	101·83	104·83	88·91	94·96	95·79	85·15	98·25	82·91	90·73	1903
Mean of 16 years	61·33	63·92																		
Mean of 9 years	63·81	66·60	76·56	55·33	77·13	80·69	87·65	77·09	82·16	56·88	71·73	75·12	65·98	67·70	62·03	61·91	68·99	66·44	65·16	

I am,
Your obedient servant,
T. F. HARVEY.

Dairies and Cowsheds.

Considerable attention has been paid to the conditions under which the milk of the district is collected and retailed, as a pure milk supply comes next to a pure water supply.

To the younger generation, who depend almost entirely on it for their nourishment, a pure, clean, and wholesome milk supply is all-important, and we had during the year an experience which showed that adults are not insusceptible to the effects which follow its negligent or ignorant handling.

There is no reason to think that the conditions under which milk is sold here is any worse than in other districts; undoubtedly, the state of the cowsheds has undergone a change for the better in recent years, and the use of a number of the older and least satisfactory ones has been discontinued; but there is room for much future improvement.

In some respects, we are more fortunately situated than they are in some other Urban Districts. With three exceptions, all the milk sold is produced within the district or in the immediate neighbourhood. The milk can thus be delivered to the consumer within a few hours of leaving the cow. It is doubtful to what extent this minimizes the risk, but probably in some instances of contamination it could result in the milk being consumed before the production in it of any toxic condition. At any rate, this obviates the necessity of railway transit, with its obvious chances of pollution ond adulteration, The supervision of the Food and Drugs Acts is under the control of the police, and the analysis of milk is undertaken by the County Analyst; but, from figures kindly supplied by Superintendent Townsend, it seems that less than 5 per cent. of the samples taken is found to be adulterated. This compares very favourably with other parts of the kingdom. Throughout England and Wales the percentage of adulteration amounted in 1902 to 11·6, and in London it was 15·6. All the Cowsheds within the district are used for a portion of the year only; the cows during the summer months are out on the land grazing. Possibly, this does not conduce to a more marked cleanliness in the collection of the milk; but, in spite of the experience of some authorities, it is difficult to imagine but that it tends to improve the health of the cattle, and, more especially, renders them less liable to suffer from tuberculosis.

There are on the register 32 milkshops and 119 cowsheds.

29 of the former obtain their milk from farmers residing either in the district or within the area of the neighbouring rural districts of Gelligaer or Vaynor. One dairyman obtains all the milk from Somerset; another a portion of it from the same place; and the third from Ross, Herefordshire.

The average number of cows in the registered cowsheds was 600, and in 73 cowsheds less than 5 cows each were kept.

In 101 of the cowsheds the walls were of stone; in 3 of brick; in 13 of wood; and in 2 of corrugated iron.

Part I of the "Regulation" applies to 49 of the cowsheds, "as the cows from which are habitually grazed on grass land during the greater portion of the year, and, when not so grazed, are habitually turned out during a portion of each day."

No provision is made in the Regulations as to air space in respect to this class of cowshed.

Part II applies to the other 79 cowsheds, the cows from which are grazed during the summer months, but, owing to their situation, they cannot be turned out when not so grazed. A large number of the latter class of cowsheds are wedged in between buildings and the air space around the building is often inadequate.

The means of lighting and ventilation have been greatly improved, but it is often found that, where they have been provided, the windows are covered and the openings closed. There is a prejudice among cowkeepers that a dark, ill-ventilated cowshed is more conducive to the well-being of the cattle than a well-lighted building, provided with sufficient air inlets and outlets.

A subject of great importance, but one which is almost entirely neglected, is the observance of cleanliness at the time of milking. Regulation 17, sec. 5, provides that a cowkeeper shall not cause or suffer any cow belonging to him or under his care or control to be milked for the purpose of obtaining milk for sale

(a) Unless, at the time of milking, the udder and teats of such cows are thoroughly clean; and

(b) Unless the hands of the person milking such cow also are thoroughly clean and free from all infection and contamination.

There is no attempt made at the grooming of the cows, and in no instance have we found signs that the udders and teats had been washed prior to milking. Possibly, the hands of the person milking are previously washed in the house, but certainly no provision is made in the cowshed. This simple rule of cleanliness is so easily observed, that the washing of the hands, udder, and teats prior to each milking would entail but a small expense and labour. In the observance of this regulation, the personal element must always play a prominent part.

In one instance only was infection probably traced to the milk supply, and the details are given on pages 23-24.

Slaughter Houses.

There are 34 Slaughter Houses in the district; one new license was granted during the year.

Proceedings were instituted against three occupiers for infringement of the byelaws.

Common Lodging Houses.

There are in the district 17 Registered Common Lodging Houses. Seven applications for new licenses were granted during the year, 1 in Penydarren and 6 in the Town Ward.

Situation.		Accommodation.
Dowlais	1	25 lodgers.
Penydarren	1	66 ,,
Cyfarthfa	1	46 ,,
Town	12	295 ,,

Water Supply.

There was no deficiency in the amount of water supplied during the year, and there is not much fear of such a contingency arising even in a period of drought. There is reason to believe that too much reliance is placed on the unlimited quantity of water at the disposal of the Council, and a great deal of the water is wasted. This is noticeable in those instances where the houses have not an individual supply, but where a court and sometimes a whole street are supplied from one outside tap. These taps are constantly out of repair, and the householders are not always careful to turn the water off after use.

The drains are not flushed by such means, and the water thus wasted answers no useful purposes.

Tents, Vans, and Sheds

For years there has been at different times a collection of tents and vans in various parts of the district. They mostly belong to the proprietors of travelling shows, and gipsies are but rare and occasional visitors to the place. A large number of the former used to congregate at the Iron Bridge and Gellifaelog, and at no season of the year were these grounds free of tents and vans.

At Treharris, Troedyrhiw, and Abercanaid the ground was occupied for but a limited period of the year. The shows were open over the public holidays, Christmas, Easter, Whitsun, and August, at the termination of which both the occupiers and vans left to re-appear at the next holiday season.

These five places were the recognised show grounds, but isolated tents and vans were occasionally pitched elsewhere.

Although Section 9 of the Housing of the Working Classes Act, 1885, provides that a sanitary authority may make byelaws to regulate van and tent dwellings, it was not until recently deemed expedient to utilise this opportunity.

Last year the Council adopted byelaws for the promotion of cleanliness, the prevention of the spread of infectious disease, and generally for the prevention of nuisances in connection with tents, vans, sheds, and similar structures used for human habitation, and these were sanctioned by the Local Government Board on March 28th, 1903. With one exception the model series of byelaws were adopted. The chief difficulty experienced in connection with all these structures has been the want of closet accommodation and of a receptacle for refuse.

Under the "Interpretation of Terms," the expression "occupier" when used in relation to any tent, van, shed, or other similar structure, is defined as meaning the person who, for the time being has the charge, management, or control of such structure.

In some cases this definition of occupier would indicate the owner or lessee of the land, but in this district the person owning the van also occupied it, and in the circumstances the byelaw imposed no duty on the owner of the land. The clauses, in the model series, which dealt with the provision of closet accommodation and refuse receptacles would remain inoperative, as the stay of each van was short, and the occupier would have removed before proceedings could be instituted. To surmount this difficulty the following byelaw was adopted, and ultimately sanctioned:—

"The person by agreement with or by license from whom any tent, van, shed, or other similar structure used for human habitation, shall be erected or brought on any land shall, in any case in which nuisance is likely to arise from the want of privy accommodation, and of a receptacle for refuse, for the use of the occupants of such tent, van, shed, or structure, provide for their use on such land sufficient privy accommodation and a sufficiently covered ashpit, dustbin, or other receptacle for refuse."

Proceedings were instituted against the owners of the land on two occasions, and closets were consequently erected.

New Buildings, &c.

The granting of Certificates for new buildings is under the control of the Surveyor's Department, and the following figures have been kindly supplied by the Building Inspector.

Altogether 353 certificates were granted; 341 were for new buildings, and 12 were for premises re-built.

Of the new buildings erected, 61 were in Dowlais, 83 in Penydarren, 12 in Cyfarthfa, 76 in Town, 15 in Plymouth, and 94 in the Merthyr Vale Ward.

These are independent of the houses built by the Council under Part III. of the Housing of the Working Classes Act. This scheme has not yet been completed. On January 1st, 1904, 83 of the houses had been erected and occupied.

New bye-laws, in respect to New Streets and Buildings, were made by the Council, and sanctioned on July 15th, 1903.

Formerly, the model series were almost uniformly adopted, but the circumstances of some parts of the district were exceptional, and these conditions gave rise to difficulties. This was particularly felt in respect to the open space at the rear of dwellings. The proper provision of through ventilation for domestic buildings is, of course, important, and the byelaw previously in force insisted that every person who shall erect a new domestic building shall provide an open space of 200 square feet, and such open space shall extend laterally throughout the entire width of such building, and the distance across such open space shall not in any case be less than 10 feet. In some parts of the district the valleys are so narrow, and the ground rises so rapidly as to render the cost of excavation necessary for the purpose of the byelaw almost prohibitive. It has been pointed out in former Reports that in many instances high retaining walls have been erected at the rear of the houses, and the specific object of the byelaw was defeated, as the open space was really limited to the space between the retaining wall and the rear of the dwelling. In last year's Report some of the houses in Old Brewery Street were given as instances, where a retaining wall 20 feet high was built within 3 feet of the house, and a free circulation of the air about the buildings could not be secured. To meet such conditions an additional byelaw was framed, which required that, in any case where the ground in the rear of the intended site of a new domestic building rises so rapidly as to render it impracticable to comply with the requirements of the preceding byelaw, every person who shall erect a building shall provide at the rear of such building, at a level not above the floor of the lowest storey thereof, an open space free from any erection. Such open space shall extend laterally throughout the entire width of such building, and the distance across such open space from every part of the building must be not less than 4 feet. He shall provide a further open space to extend laterally throughout the entire width of the building, so that, to a distance of 10 feet from the house, the ground shall not rise at a gradient exceeding 1 foot in 2 feet of horizontal distance from the rearmost wall of the building at the line where such wall meets the surface of the adjoining ground. If the height of the building exceed 15 feet, the open space correspondingly increases.

32 houses were represented as unfit under Section 32 of the Housing of the Working Classes Act, 1890.

Four were closed ; two were cellar houses under High Street, Penydarren, and the other two were very small one-storey buildings in Gate Street, Caepanttywyll.

12 over-and-under dwellings in Tai Harri'r Blawd were also closed, but they were subsequently rendered fit by converting them into 6 houses.

10 houses in Lower High Street, Dowlais, were similarly rendered fit.

House Refuse.

There is no improvement to be recorded in the method by which house refuse is disposed of; with each succeeding year the evil becomes aggravated. It is deposited on waste land, the accummulations being called Refuse Tips. There are 10 of these tips within the district; all are unsightly and objectionable, but some of them are positively dangerous.

The least offensive are the Plymouth, Troedyrhiw, and Graigberthlwyd Tips.

Plymouth Tip.

The refuse of Merthyr Town, Georgetown, Brecon Road, and Abercanaid is at present tipped into a hollow on the western side of the road leading from Merthyr, across the Brandy Bridge, to Abercanaid. It was formerly tipped on the waste ground between the road and the river, but when that space became exhausted the present site was utilised.

About 80 loads are deposited daily.

The nearest houses are at Glyndyris, which are about 200 yards from the present site of tipping; Upper Abercanaid would be at a still greater distance from it, and Gwilym Terrace, Mardy Terrace, Railway Terrace, and Penyard, Plymouth, are more than a quarter of a mile away. No complaints have been received in respect to this tip.

Graigberthlwyd Tip.

The refuse of Quakers' Yard Village and Graigberthlwyd is deposited in a hollow about 100 feet deep, which is situated alongside the Pontypridd road on the eastern bank of the River Taff. About 7 loads are deposited here daily.

The tip is about 200 yards from the Glantaff Inn, Quakers' Yard, and about the same distance from the Rock Houses. The nearest buildings would be the houses situated at Victoria Terrace, Pentwyn; but, as they are on higher ground, the inconvenience experienced by the occupiers is not great. It is fortunate that this tip is so well situated, as its contents are the most objectionable in the whole parish. The premises at Victoria Terrace and Wingfield Terrace are not connected with the main sewer, but have earth closets; and, though the privy-contents are mostly used for agricultural purposes, they are sometimes deposited here. Farmers have an objection to use the refuse for manurial purposes if it contains a large proportion of street sweeping and ashes.

Troedyrhiw Tip.

The refuse from Troedyrhiw, amounting to about 10 loads daily, is deposited alongside the main road to Merthyr, near the

Old Harp. With the exception of this building, there are no other dwellings in the immediate neighbourhood, the nearest being situated in Merthyr Road, Troedyrhiw.

In dry weather the refuse is utilised to fill in the hollow part of a field, which is situated between the main road and the Taff Vale Railway.

Caeracca Tip.

This is situated alongside the path leading from Pant to Pengarnddu, on the eastern side of the Morlais Brook. Until recently, the amount deposited here was only a couple of loads daily, but since the neighbourhood has been developed the tip has assumed formidable proportions. The new houses built and in course of erection at Caeracca will be within 100 yards of it.

Gellifaelog Tip.

This tip is situated in the hollow between the old Cinder Tip of the Dowlais Works and the High Street, Penydarren.

The houses in the High Street are within 30 yards of it, and the surface of the tip is on a higher level than the roadway of the street.

To enable the deposit of house refuse to continue, the Morlais Brook, on various occasions, has been culverted over. With each extension the number of houses affected increases, as the line of extension runs parallel with the High Street. Tipping has now been carried on here for many years, and the huge accummulation forms as ungainly a sight as can be imagined. It receives the refuse of the greater part of Dowlais and the upper portion of Penydarren, and about 70 loads are deposited daily.

The tip is not fenced in, and women and children are allowed to roam over it and sort the refuse. Apart from the risk run, they raise the dust and scatter it about the neighbouring houses.

During warm weather the premises within a radius of about 250 yards are pestered with flies.

Aberfan Tip.

This is situated at the rear of the Aberfan Free Library in Bridge Street. The refuse is deposited on a waste piece of land, which is triangular in shape, bounded on one side by Bridge Street, and on the other two sides by the River Taff and Pantglas Brook. About 8 loads are deposited daily, and the tipping space will soon be exhausted. The houses in Bridge Street are within 30 yards of the accummulation, and at about the same distance from it are the premises on the north-eastern side of Aberfan Road and Aberfan Crescent, but the latter are on a higher level.

Merthyr Vale Tip.

The refuse of Merthyr Vale is tipped into a hollow, which is situated between the Taff Vale Railway on the one side, and the road leading to the rear of Prospect Place and Clive Place on the other.

Tipping has been discontinued immediately in front of Gray's Place, but the spot where the refuse is at present deposited is within less than 100 yards of the houses in Gray's Place and Prospect Place.

About 8 loads are collected and daily deposited.

Treharris Tip.

The refuse of Treharris and Edwardsville is tipped into a triangular hollow, about 200 feet deep, which is situated on the western side of Cardiff Road and on the northern bank of the Bargoed-Taff River. About 20 loads are deposited daily. Melingaiach, Railway Terrace, Cardiff Road, and Cardiff Street are all within 40 yards of the tipping ground. Melingaiach, consisting of a group of 10 houses, situated on the southern bank of the Bargoed-Taff, would be, from the configuration of the ground, the part most injuriously affected. The houses are on a level with the base of the tip, and, therefore, exposed to its whole surface.

The occupiers of the other premises affected would not suffer to quite the same extent, but complaints are constantly received as to the nuisance created and the inconvenience suffered. There used to be another tipping ground near Gresham Street. This is not now an authorised one, but refuse is still occasionally deposited there. The occupiers of the neighbouring houses, when warned by the Sanitary Inspector, shift the responsibility on to the shoulders of the contractor, which, I think, is unfair, as recently there is no ground for such a complaint.

There can be no doubt as to the utter unsuitability of the four latter sites for tipping purposes. The most objectionable, both on account of its magnitude and position, is probably the one at Gellifaelog. How to dispose of the refuse so as not to create a nuisance is a problem which must demand the serious attention of the Council. Suitable sites are getting scarce, and some of the present ones will soon be exhausted. An extension at Gellifaelog has always been an expensive matter, as it involves the culverting of the Morlais Brook. Apart from the question of cost, it is highly important from a public health point of view that the refuse should not be deposited near any dwellings. It has been calculated that the refuse from towns contains nearly 30 per cent. of putrescible organic matter. It is most putrescible in quality at the time of the year when putrefaction is most active; in summer greenstuff is most plentiful, and ashes least abundant.

Fortunately, the summers of 1902 and 1903 have been wet, but in a dry season the nuisance will recur, and these accummulations always create inconveniences, and sometimes they are capable, possibly, of infecting neighbouring houses. It is impossible to even mitigate the evil by the use of disinfecting and deodorizing substances; it has been found in other places that they only constitute a palliative, the cost of which would not be justified by the results obtained. Moreover, the methods employed to disinfect the refuse are most difficult of application.

On various occasions the Council has had reports submitted to it on the disposal of refuse by burning. The first report was by your engineer, Mr. Harvey, and Messrs. Handcock and Dykes have also reported on two occasions, 1898 and 1902. It is hoped that some advance will soon be made, as the practice as at present carried out is universally condemned and should be abandoned.

The scavenging is done by contract, the parish being divided for the purpose into 9 districts. With the exception of a few outlying places, the carts collect the refuse daily.

As the area of daily collection extends, the number of street ashbins is reduced; but whenever these are removed, persons will persist in depositing the refuse on the spot previously occupied by the bin, and all the prosecutions during the year for depositing ashes on the street were instituted as a result of infringements of the byelaws in such circumstances.

The street bins have also to be retained where the entrance to a court is by a comparatively long, narrow passage; but places where this condition exists are becoming less frequent.

Dowlais Ward.

The term "Dowlais Ward" is not synonymous with what is popularly known as Dowlais. The boundary line between the Dowlais and Penydarren Wards runs through the centre of George Street, Brynzion Street, Walter Street, and along the pathway leading to the Graig Brook; thence along the Morlais Brook to Caeracca Bridge, and thence along the centre of Pant Road to Penrhiwcamran; so that the whole of Gellifaelog and the houses on the southern side of Pant Road beyond Caeracca Bridge are in the Penydarren Ward.

The elevation above sea-level varies from 800 feet at Gellifaelog to 1,760 at Pwll Mawr.

The population is estimated at 12,686, and the death-rate at 20·6 per 1,000.

The death-rate of the ward was nearly 9 per cent. higher than that of the whole parish. It is sometimes assumed that Dowlais, from its exposed position, and with a cold, damp climate, must of necessity have a high death-rate. Nothing could be more fallacious, as the more recently-built portion is one of the most exposed and, at the same time, one of the healthiest localities in the district. It is the older and more insanitary areas that, year after year, contribute to the higher death-rate, and in 1903 there was an excessive mortality in each of the following:—

Cwmrhydybedd, 14 deaths; Ifor Street, 16; Well Street, 11; Cross Street, 5; South Street, 7; Wind Street, 7; Horse Street, 4; Lewis Street, 7; George Street, 10.

These places contain 469 houses, so that last year one death occurred in every 6 houses. Throughout the district the average is, roughly, one death for every 10 houses.

Cwmrhydybedd consists of 117 houses, which are scattered irregularly along the north-eastern bank of the Morlais Brook.

Various improvements have been carried out here; the sewer has been extended and the premises drained; but some of the houses are of a poor type; a few are back-to-back, and some built against the earth.

At Ifor Street a large amount of work has been executed during the year, and most of the back yards have been paved.

The condition of the localities around South Street has been reported on in previous Reports.

With few exceptions, the houses in Cross Street and George Street are now through, with a fair amount of air space at the rear; but both streets are narrow, especially the eastern end of the former and the southern end of the latter.

Plans have been prepared for the improvement of Thomas Court (which extends in an irregular manner from South Street to Wind Street), but the work has not yet been carried out.

Pengarnddu is still undrained, and the water supply is derived from a partially-protected spring.

Penydarren Ward

Extends from George Street, Brynzion Street, and Walter Street, to the Brecon Road, and includes not only Penydarren proper, but also that portion of Dowlais between the above-mentioned streets and the Morlais Brook, the houses on the southern side of Pant Road beyond Caeracca Bridge, and the district lying to the north of Brecon Road known as Tydfil's Well and the Park, together with the major portion of Mountain Hare, Penyard, and Trevethick Street.

The elevation above sea-level varies from 600 feet at Pontmorlais to 1250 at the Morlais Castle, but most of the inhabited portion is at an altitude varying from 600 to 900 feet.

The population is estimated at 15,505, and the death-rate at 19·2 per 1,000.

Three houses in Gas Row were closed during the year; they had no drainage, and were generally in a dilapidated condition.

10 houses in Lower High Street, Dowlais, and five in Plough Court were represented as unfit. Nos. 239 to 423 Lower High Street, were built over Nos. 16—20 Plough Court; the latter premises were discontinued as separate habitations, and were made a part of the houses in Lower High Street.

The whole of Gellifaelog had an excessive death-rate; but Gas Row with nine deaths, Sand Street with nine deaths, and Lower High Street with seven deaths, have the worst records. Another area to which attention has frequently been directed is High Street, Penydarren, together with the courts between that street and the Morlais Brook. Formerly, the houses on the south-eastern side of High Street had no slop-drainage, the slops being usually thrown on the street. The cellars underneath were separately occupied, and had no communication with the premises above them. As a result of representations under the Housing of the Working Classes' Act, staircases were put in and the cellars were made part of the overlying premises. The same process was carried out in Upper and Lower Company Rows.

All these houses have to be frequently inspected so as to prevent separate occupation and overcrowding.

Gellifaelog and the said area around High Street contain less than one-third of the total number of inhabited houses in the ward; but of the 298 deaths in Penydarren, 151 occurred in these two localities.

Cyfarthfa Ward.

The ward extends along both banks of the River Taff from Cefn Bridge to the confluence of the Morlais and Taff.

The elevation above sea-level varies from 500 to 1,500 feet.

The population is estimated at 8,978, and the death-rate at 21·6. The ward has the highest death-rate in the parish, being 14 per cent. higher than that of the whole district, and 28 per cent higher than that of the Plymouth Ward.

Whooping Cough and Measles were prevalent during the year, but the ward was almost free from Diphtheria; only three cases were notified, and one death registered.

The river unequally divides the ward; on the north-eastern bank are Caepanttywyll, with Quarry Row, Bryant's Field, Morgantown, Bethesda Street, and Abermorlais.

Attention was called to Caepanttywyll, and the Council ordered the streets to be repaired. The steam roller was with difficulty taken over there; but, unfortunately, owing to pressure of other work, Caepanttywyll was left unfinished. The work in Waterloo Street and Taff Street was completed; in Chapel Street the channelling only was done, and Queen Street and King Street are untouched.

The entrance to Caepanttywyll from Quarry Row is an eyesore; the road is narrow and out of repair, and many of the neighbouring houses are unoccupied and in ruins.

Two houses in Gate Street were closed during the year.

Some of the streets in Bryant's Field are in a deplorable state. Sunny Bank, Drysiog Street, Brewery Street, and Park Street have not been taken over, nor are they repairable by the Council.

The roadway is in bad repair; the channelling is of rough cobble stone, and the pavement is in some places defective.

Bank Street has been greatly improved. The road has been widened and repaired, and a retaining wall built on the south-western side of the street, between it and what remains of High Germany. The total cost was £189.

The mortality in both Caepanttywyll and Bryant's Field was excessive, and higher than in the rest of the ward; 35 deaths occurred in Caepanttywyll; 32 in Bryant's Field, and six in Morgantown.

On the south-eastern side of the Taff the ward includes Upper Abercanaid, Colliers' Row, Georgetown, Heolgerrig, and Clwydyfagwyr.

The main sewer and the water-main have been extended at Heolgerrig, and, with few exceptions, the houses there are now drained and supplied with the Council's water. The village is exposed to the vicissitudes of the weather, and this partly accounts for the excessive mortality during the winter months. In the five months, January, February, October, November, and December, 14 deaths occurred; but during the remaining seven months only four persons died there.

There is room ror much improvement in Georgetown.

The manner in which The Flats, or Section Houses, are conducted affords a perennial source of complaint. The building was formerly a chapel, which was converted into tenement dwellings, but it is ill adapted for the purpose. It contains 21 tenements; the passages and landings are dark and badly ventilated, and the closets are constantly out of repair.

The cause of complaint as to the state of Aberdare Road has now been removed. Formerly, the houses abutting on the street had no back doors, no slop drainage, and an insufficient closet accommodation; the road consequently was usually in a filthy condition. An area has now been obtained at the rear of the houses, and slop drains and closets provided there.

The sanitary condition of Rhydycar and Colliers' Row is unsatisfactory; a delay has occurred here owing to the difficulty of devising a suitable means of drainage. The premises cannot be drained into the sewer, and it has now been decided to construct cesspools in preference to earth closets.

Town Ward

Consists of only a portion of what is, strictly speaking, Merthyr proper. It lies at an altitude varying from 450 to 1,500 feet. The population is estimated at 12,181, and the death-rate was 17·6 per 1,000.

Scarlet Fever was prevalent in Caedraw and Twynyrodyn, and during the earlier part of the year Whooping Cough accounted for six deaths in the ward. Tai Harri'r Blawd, twelve under-and-over houses, situated at the northern end of the Tramroad, were represented as unfit in June, and a closing order was obtained in September. They have since been re-built, and made into six two-storey dwellings. No improvement can be recorded in the sanitary state of the houses on the Tramroad, and many of them are in an extremely unsatisfactory condition.

The same remarks hold true of Garden Street and Temperance Street. Caedraw has received considerable attention from the Sanitary Inspector, and all the houses in Picton Street now have back doors, and slop-drains have been provided at the rear of the premises. This did not have the effect of entirely preventing the occupiers from throwing slop-water on the street; but since Police-court proceedings were instituted against some of the tenants, the practice has almost ceased.

Adam and Eve Court was reported on, and the owners ordered to carry out improvements.

Plymouth Ward

Consists of Abercanaid, Duffryn, and Troedyrhiw.

Most of the houses are situated on the low-lying land on both sides of the Taff, but the ward has an altidude varying from 490 to 1,600 feet above sea level.

The population is estimated at 8,754, and the death-rate at 16·9 per 1000. This division had the lowest death-rate in the district. Scarlet Fever was prevalent throughout the year, and accounted for seven deaths, but the mortality from the other zymotic diseases was very low. The ward, on the whole, is in a fairly good condition; there is probably less overcrowding here than in any other division in the parish. The drainage of some of the houses on the Canal bank, and in Pentrebach, is not satisfactory, and a large number of houses in the latter place are supplied with water from an outside tap.

Merthyr Vale.

This ward is almost entirely of a comparatively recent growth. It includes Aberfan with Merthyr Vale, Edwardsville, Treharris, and Graigberthlwyd. It varies in height above sea-level from 300 feet at Quakers' Yard, to 1,500 at Graigyrefail.

The population is estimated at 13,547, and the deaths correspond to a rate of 18 per 1,000.

In spite of the large number of houses recently erected at Aberfan, overcrowding is still prevalent there.

Considerable trouble has been experienced in dealing with the drainage of Thomas Street. This was due, partly to the insufficient fall, and probably a slight subsidence has disturbed the position of the drain-pipes. Scarlet Fever was prevelant in Aberfan, and Measles in Treharris.

108 deaths occurred in Aberfan (with Merthyr Vale), and 96 in Treharris.

Complaints were received from the Mountain Ash Urban District Council as to a nuisance at Lockywain. Lockywain consists of eight houses, situated on the southern bank of the Aberdare Canal, near Abercynon.

Some years ago permission was granted to drain the premises on to a field. The locality was then isolated, and remote from any populous district, but recently Abercynon has been developed, and a new street laid out and extended to within thirty yards of the premises. Arrangements were come to by which the field was discontinued for irrigation purposes, and the drainage of Lockywain was connected to the sewer of the Mountain Ash Urban District Council.

Inspection.

On page 58 will be found a Summary of the visits paid, and notices issued by the Sanitary Inspectors during the year.

Over 5,000 house-to-house inspections were made, and over 1,000 other premises were visited to investigate infectious diseases. That these were not unnecessary is evident from the fact that over 4,000 nuisances were detected as a result.

The practice of throwing slop-water on the street has not yet been entirely stopped, and proceedings were instituted against 25 persons who were caught in the act.

A large number of visits were paid to stables, especially in the Town Ward. Many of these have been converted into stables from disused dwelling houses, and consequently are in close proximity to other inhabited houses. A considerable improvement has to be noted in their condition, a result due, primarily, to proceedings taken under a new nuisance byelaw framed by the Council, and added to the model series, and which provides that, in certain circumstances, the floor of stables shall be paved with a hard and impermeable material.

The Slaughterhouses, Dairies, and Cowsheds were regularly inspected.

The Inspectors also superintend the disinfection of premises after infectious diseases, and over 1,000 houses were thus fumigated, and the clothing disinfected in the Steam Disinfector.

TABLE I.—VITAL STATISTICS OF WHOLE DISTRICT DURING 1903 AND PREVIOUS YEARS.

Name of District.—MERTHYR TYDFIL.

YEAR.	Population estimated to Middle of each Year.	BIRTHS.		TOTAL DEATHS REGISTERED IN THE DISTRICT.				Total Deaths in Public Institutions in the District.	Deaths of Non-Residents registered in Public Institutions in the District.	Deaths of Residents registered in Public Institutions beyond the District.	NETT DEATHS AT ALL AGES BELONGING TO THE DISTRICT.	
		Number.	Rate.*	Under 1 Year of Age.		At all Ages.					Number.	Rate.*
				Number.	Rate per 1000 Births registered.	Number.	Rate.*					
1	2	3	4	5	6	7	8	9	10	11	12	13
1893	61492	2408	39·1	529	209	..	..	153	..	..	1433	23·2
1894	62439	2303	36·8	429	186	..	..	80	..	..	1300	20·8
1895	63402	2532	40·1	610	240	..		110	.	..	1647	26
1896	64378	2334	36	507	217	.	..	103	.	..	1375	21·3
1897	65370	2471	37·8	530	214	.	...	100	...	..	1598	24·4
1898	66377	2495	37·7	498	198	..	..	119	..	.	1409	22·7
1899	67400	2357	34·9	640	272	..	..	160	..	..	1690	25
1900	68438	2658	38·8	483	181	..	..	131	..	..	1624	23·7
1901	69493	2689	38·6	704	261	1851	..	176	56	..	1795	25·8
1902	70608	2797	39·6	518	183	1659	.	204	39	.	1622	22·9
Averages for years 1893-1902.	65939·7	2504·4	37·9	544·8	217	..	..	142·4	..	..	1549·3	23·4
1903	71651	2752	38·4	422	153	1390	..	169	30	..	1360	18·98

* Rates in Columns 4, 8, and 13 calculated per 1000 of estimated population.

NOTE.—The deaths to be included in Column 7 of this Table are the whole of those registered during the year as having actually occurred within the district or division. The deaths to be included in Column 12 are the number in Column 7, corrected by the subtraction of the number in Column 10 and the addition of the number in Column 11.

By the term "Non-residents" is meant persons brought into the district on account of sickness or infirmity, and dying in public institutions there; and by the term "Residents" is meant persons who have been taken out of the district on account of sickness or infirmity, and have died in public institutions elsewhere.

The "Public Institutions" to be taken into account for the purposes of these Tables are those into which persons are habitually received on account of sickness or infirmity, such as hospitals, workhouses, and lunatic asylums. A list of the Institutions in respect of the deaths in which corrections have been made should be given on the back of this Table.

I. Institutions within the District receiving sick and infirm persons from outside the District.	II. Institutions outside the District receiving sick and infirm persons from the District.	III. Other Institutions, the deaths in which have been distributed among the several localities in the District.
Union Infirmary. General Hospital. Fever Hospitals.		

Is the Union Workhouse within the District? YES.

TABLE II.—VITAL STATISTICS OF SEPARATE LOCALITIES IN 1903 AND PREVIOUS YEARS.

Name of District.—MERTHYR TYDFIL.

NAMES OF LOCALITIES.	1.				2. DOWLAIS.				3. PENYDARREN.				4. CYFARTHFA.				5. TOWN.				6. PLYMOUTH.				7. MERTHYR VALE.			
YEAR.	Population estimated to middle of each year.	Births registered.	Deaths at all Ages.	Deaths under 1 year.	Population estimated to middle of each year.	Births registered.	Deaths at all Ages.	Deaths under 1 year.	Population estimated to middle of each year.	Births registered.	Deaths at all Ages.	Deaths under 1 year.	Population estimated to middle of each year.	Births registered.	Deaths at all Ages.	Deaths under 1 year.	Population estimated to middle of each year.	Births registered.	Deaths at all Ages.	Deaths under 1 year.	Population estimated to middle of each year.	Births registered.	Deaths at all Ages.	Deaths under 1 year.	Population estimated to middle of each year.	Births registered.	Deaths at all Ages.	Deaths under 1 year.
	a.	*b.*	*c.*	*d.*	*a.*	*b.*	*c.*	*d.*	*a.*	*b.*	*c.*	*d.*	*a.*	*b.*	*c.*	*d.*	*a.*	*b.*	*c.*	*d.*	*a.*	*b.*	*c.*	*d.*	*a.*	*b.*	*c.*	*d.*
1893 ..	61492				12260				11217				8785				10667				8115				10454			
1894 ..	62439				12288				11617				8813				10778				8166				10777			
1895 ..	63326				12317				12032				8842				10889				8217				11029			
1896 ..	64378				12346				12462				8871				11001				8269				11429			
1897 ..	65370				12375				12908				8900				11113				8321				11763			
1898 ..	66377				12404				13370				8929				11225				8374				12075			
1899 ..	67400				12432				13840				8958				11338				8427				12405			
1900 .	68438				12461				14342				8988				11451				8481				12715			
1901 ..	69493				12490		472		14854		265		9018		261		11565		280		8536		220		13030		297	
1902 ..	70608						320				393				227				269				168				245	
Averages of Years 1903 to 1902.																												
1903 ..	71651	2752	1360	422	12686		261		15505		298		8978		194		12151		214		8754		148		13547		245	

NOTES.—(*a*) The separate localities adopted for this Table should be areas of which the populations are obtainable from the Census returns, such as wards, parishes or groups of parishes, or registration sub-districts. Block 1 may, if desired, be used for the whole district; and blocks 2, 3, &c., for the several localities. In small districts without recognised divisions of known population this Table need not be filled up.

(*b*) Deaths of residents occurring in public institutions beyond the district are to be included in sub-columns *c* of this table, and those of non-residents registered in public institutions in the district excluded. (See note on Table I. as to meaning of terms "resident" and "non-resident.")

(*c*) Deaths of residents occurring in public institutions, whether within or without the district, are to be allotted to the respective localities according to the addresses of the deceased.

(*d*) Care should be taken that the gross totals of the several columns in this Table respectively equal the corresponding totals for the whole districts in Tables I. and IV.; thus, the totals of sub-columns *a*, *b*, and *c* should agree with the figures for the year in the columns 2, 3, and 12 respectively, of Table I.; the gross total of the sub-columns *c* should agree with the total of column 2 in Table IV., and the gross total of sub-columns *d* with the total of column 3 in Table IV.

TABLE III.—CASES OF INFECTIOUS DISEASE NOTIFIED DURING THE YEAR 1903.

Name of District.—MERTHYR TYDFIL.

NOTIFIABLE DISEASE.	CASES NOTIFIED IN WHOLE DISTRICT.							TOTAL CASES NOTIFIED IN EACH LOCALITY.						NO OF CASES REMOVED TO HOSPITAL FROM EACH LOCALITY.						
	At all Ages.	AT AGES†—Years.						1	2	3	4	5	6	1	2	3	4	5	6	7
		Under 1.	1 to 5.	5 to 15.	15 to 25.	25 to 65.	65 and upwards	Dowlais.	Penydarren.	Cyfarthfa.	Town.	Plymouth.	Merthyr Vale.	Dowlais.	Penydarren	Cyfarthfa.	Town.	Plymouth.	Merthyr Vale.	Outside.
Small-pox	7				1	6		2	3			2		2	3			2		1
Cholera																				
Diphtheria	110	3	38	53	10	6		29	35	3	8	5	30	5	9				6	
Membranous Croup ..																				
Erysipelas	47	2	2	2	6	31	4	8	4	15	13	1	6	1	1		2			
Scarlet Fever	614	9	222	328	34	21		30	87	65	184	110	138	1	18	20	46		8	
Typhus Fever	1					1					1						1			
Enteric Fever	294		18	89	80	107		40	91	55	80	24	4	18	61	18	47	7	6	9
Relapsing Fever ..																				
Continued Fever ..																				
Puerperal Fever ..	9				2	7		1	2	1	2		3							
Plague																				
*																				
TOTALS	1082	14	280	472	133	179	4	110	222	139	288	142	181	27	92	38	96	9	20	10

NOTES.—The localties adopted for this Table should be the same as those in Tables II. and IV.

State in space below the name of the Isolation Hospital, if any, to which residents in the district, suffering from infectious diseas, are usually sent. Mark (H) the locality in which it is situated, or if not within the district, state where it is situated, and in what district. Mark (W) the locality in which a Workhouse is situated.

* This space may be used for record of other disease the notification (compulsory or voluntarily) of which is in force in the district.

† These age columns for notification should be filled up in all cases where the Medical Officer of Health, by inquiry or otherwise, has obtained the necessary information.

*Isolation Hospital*____________________

TABLE IV.—CAUSES OF, AND AGES AT, DEATH DURING YEAR 1903.

Name of District.—MERTHYR TYDFIL.

CAUSES OF DEATH.	DEATHS IN OR BELONGING TO WHOLE DISTRICT AT SUBJOINED AGES.							DEATHS IN OR BELONGING TO LOCALITIES (at all Ages).							TOTAL DEATHS IN PUBLIC INSTITUTIONS IN THE DISTRICT
	All Ages.	Under 1 year.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 65.	65 and upwards.	Dowlais.	Penydarren.	Cyfarthfa.	Town.	Pl. mouth.	Merthyr Vale.		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Smallpox	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Measles	33	17	15	1	...	...	...	9	4	12	1	...	7	...	1
Scarlet Fever	29	2	18	8	1	...	...	4	4	2	6	7	6	...	2
Whooping-cough	30	18	12	...	...	...	...	3	3	6	6	1	11	...	...
Diphtheria and Membranous Croup	25	2	15	8	...	...	...	5	12	1	2	1	4	...	...
Croup	8	...	7	...	...	1	...	...	4	3	1	...	...	...	...
Fever: Typhus	1	...	...	...	...	1	...	...	...	...	1	...	...	...	1
Fever: Enteric	29	...	3	1	6	19	...	7	10	6	3	3	...	...	16
Fever: Other continued															
Epidemic Influenza	7	...	1	...	...	2	4	2	...	1	4	...	...	...	1
Diarrhœa	42	30	10	...	...	2	...	8	14	5	7	1	7	...	1
Enteritis	44	21	8	2	2	9	2	13	8	2	7	9	5	...	2
Puerperal Fever	5	...	...	...	1	4	...	...	1	1	...	...	3	...	...
Erysipelas	1	...	...	...	...	1	...	1	...	...	...	...	...	...	...
Other Septic Diseases	11	...	1	...	1	6	3	1	2	4	1	1	2	...	5
Phthisis	63	1	2	5	13	42	...	9	12	9	16	8	9	...	6
Other Tubercular Diseases	31	11	5	10	...	5	...	4	8	6	3	1	9	...	2
Cancer, Malignant Disease	33	...	...	...	...	27	6	5	10	7	4	3	4	...	7
Bronchitis	93	29	11	1	1	28	23	14	19	20	16	11	13	...	6
Pneumonia	157	43	13	3	4	49	15	31	46	18	15	7	40	...	6
Pleurisy	4	...	...	...	1	3	...	3	...	...	...	...	1	...	...
Other Diseases of Respiratory Organs	13	2	1	...	1	6	3	2	3	4	2	1	1	...	...
Alcoholism Cirrhosis of Liver	4	...	...	...	...	4	...	1	...	1	2	...	...	...	1
Venereal Diseases	6	3	...	...	...	2	1	1	2	1	2	...	...	...	...
Premature Birth	40	40	...	...	...	...	...	6	10	6	7	3	8	...	2
Diseases and Accidents of Parturition	20	...	...	...	3	17	...	2	5	4	2	2	5	...	1
Heart Diseases	110	1	...	3	5	73	28	23	18	19	24	15	11	...	14
Accidents	67	7	9	5	10	31	5	15	12	8	6	11	15	...	14
Suicides	11	...	...	...	3	6	2	...	5	3	2	...	1	...	3
All other causes	Unkn- 443	own 195	Age 1 34	10	11	102	92	92	86	45	74	63	83	...	48
All causes	1360	422	193	57	63	440	184	261	298	194	214	148	245	...	139

Inspections Made During the Year.

	District.				
	No. 1.	No. 2.	No. 3.	No. 4.	Total.
House to house	361	1105	1767	1672	4805
Infectious Diseases	354	209	158	306	1027
Infectious Diseases, re-visited	291	160	126	220	797
Slaughterhouses	155	109	117	81	462
Cowsheds and Dairies	40	52	68	30	190
Vans and Tents	16	2	—	20	38
Common Lodging Houses	2	—	4	—	6
Workshops	76	49	26	181	332
Bakehouses	26	47	15	37	125
Complaints received	60	83	63	60	266
Result of above Inspections :—					
Nuisances detected	1251	1418	1168	946	4783
Notices issued	1122	842	717	789	3470
Premises disinfected	155	138	162	225	680
Clothing disinfected	161	147	162	163	633
	ft.	ft.	ft.	ft.	ft.
Length of Drains Tested	14,555	13,394	12,122	11,284	51,355

NOTICES WERE ISSUED TO ABATE FOLLOWING NUISANCES :—

	District.				
	No. 1	No. 2.	No. 3.	No. 4.	Total.
Defective W C's.	129	231	75	157	1272
Insufficient W.C. accommodation	207	248	238	97	790
To repair slop-drains	94	108	119	69	390
To provide slop-drains	150	252	115	52	569
To drain urinals	31	9	3	6	49
To provide cistern in W.C.	42	14	2	12	70
To pave back yards	220	360	297	151	1028
To repair stable drains	55	29	—	1	85
To provide manure receptacles	35	8	5	2	50
To remove foul accummulations	29	26	12	5	72
To repair dilapidated houses	33	81	104	46	264
To cleanse dwelling houses	13	30	36	17	96
To provide rain water troughing	34	75	22	46	177
To prevent escape of sewer gas into house	7	15	5	38	65
To ventilate drains	125	94	88	64	371
To remove animals	53	25	38	25	141
To prevent overcrowding	1	38	28	1	68
Under slaughterhouse bye-laws	2	3	4	—	9
Under Factory and Workshops' Acts	2	8	2	—	12

District No. 1.—J. T. OWEN, Chief Inspector.
JNO. JONES.

District No. 2.—M. M. THOMAS.

District No. 3.—H. LL. JENKINS.

District No. 4.—D. B. DAVIES.

Bakehouses.

There are in the district 85 registered Bakehouses.

In most of these there is not a separate room for storing purposes ; the flour is kept in the baking room, with the result that the bakehouse cannot be kept as clean and wholesome as would otherwise be the case.

Thirty-six are used solely for "public baking," and bread is not retailed on the premises.

In four young persons are employed.

A report was submitted to the Health Committee in May on the underground Bakehouses. Under the Factory Act of 1901, an underground bakehouse is not to be used as such unless it was so used at the passing of the Act, and, even then, it was not to be used after January 1st, 1904, unless certified by the District Council as to its suitability for the purpose.

In the case of two underground bakehouses, a list of structural alterations was submitted, on the completion of which certificates were granted. The third was totally unfit for the purpose, and it has been discontinued as a bakehouse.

Besides these, there are 12 others which are partially underground. An underground bakehouse is defined as one any baking room of which is so situated that the surface of the floor is more than three feet below the surface of the footway of the adjoining street or of the ground adjoining or nearest to the room.

In hilly districts it is sometimes difficult to decide whether a bakehouse is underground within the meaning of the Act and therefore requiring a certificate, or only partially so. One of the bakehouses in Penydarren furnishes an illustration of this.

It forms part of a house which abuts on two streets ; the side street is so steep and the ground rises so rapidly that in one part of the bakehouse the roof is below the surface of the roadway, but the floor of the baking-room is on a level with the pavement of the main street. The air of this bakehouse is seldom uncomfortably hot, as the ground at the rear has been excavated, and the oven so arranged as to be placed entirely outside the baking-room. Typical instances of partially underground bakehouses are found in Merthyr Vale, and to anyone acquainted with the configuration of the valley there the arrangements will be obvious.

The bakehouse is entirely below the level of the street, but the floor is above the adjoining ground at the rear.

The difficulty experienced in connection with all the ones placed partially underground is the question of ventilation.

The lighting is generally ample, though most of the light is obtained from one side of the building. Some of them communicated with the street by means of an iron grating, but it was found that this arrangement rendered the room extremely dusty in dry weather, and dirty in wet weather. The occupiers have in almost all cases removed the grating, and substituted it with prismatic lights.

Workshops.

There are 243 registered Workshops in the district, a list of which is given at the end of this Report. These can be divided into two classes: Workshops in which a sedentary occupation is carried on, such as dressmakers, tailors, &c., and those in which the work requires a certain amount of movement, such as carpenters, blacksmiths, &c. The former are by far the most important from a sanitary point of view, as the majority of them are small, and the size of the room constitutes a difficulty of obtaining good sanitary arrangements. In many instances the occupiers have simply adapted an ordinary room of a dwelling-house to the purpose. Usually they are fairly well lighted; the window space is ample, and there are no adjoining high buildings which would shut out the light. The real difficulty lies in their efficient ventilation, and more especially in winter. They are generally ventilated by means of windows and fire-places only, and as the regulation amount of air-space is 250 cubic feet per worker, and 400 cubic feet during any period of overtime, it is almost impossible to obtain a reasonably pure air-supply where the windows only act as inlets, without producing an unbearable draught.

Persons leading a sedentary occupation are very apt to complain of a draught, and in cold weather usually keep the windows closed. The means of ventilation may be ample, but, unless such be utilised, their presence avails nothing. A Tobin's tube or a Sheringham's valve would be an efficient and inexpensive method by which the air of these small workshops could be prevented from becoming unwholesome.

Diseases.

Years.

	—1	5	15	25	35	45	55	65	75	85	x85
Zymotic Diseases:											
MIASMATIC—											
Measles	17	15	1	...	...	...	...	...	...	...	
Scarlet Fever	2	18	8	1	...	...	...	...	.	...	
Whooping Cough	18	12	...	...	...	...	...	..	...	...	
Typhoid Fever	...	3	1	6	10	4	4	1	...	...	
Typhus Fever	...	...	...	...	1	...	...	...	...	...	
Diphtheria	2	15	8	...	...	...	...	...	...	...	
Influenza	...	1	...	..	1	. .	...	1	4	...	
DIARRHOEAL—											
Diarrhœa	30	10	...	...	...	...	...	...	.	...	
Dysentery	..	...	...	...	2	...	...	...	...	...	
Syphilis	3	...	...	...	...	...	...	...	...	..	
Puerperal Fever	...	...	...	1	4	...	...	...	...	...	
Toxæmia, Septicœmia	...	1	...	1	1	...	1	4	2	1	
Erysipelas	...	...	...	...	1	...	...	...	...	...	
Alcoholism	...	...	...	...	...	2	2	...	..	...	
Phthisis	1	2	5	13	18	15	8	1	...	...	
Tubercular Meningitis	2	2	7	..	1	..	1	...	...	...	
Tuberculosis	5	2	3	...	2	...	1	...	...	...	
Tabes Mesenterica	4	1	...	...	..	...	...	...	...	...	
Rheumatic Fever	...	...	1	...	2	1	...	...	..	...	
(*b*) Cancer	...	...	...	...	2	1	12	12	6	...	
(*c*) Rheumatism	...	..	...	...	...	...	...	1	..	1	
Rickets	3	1	...	...	...	...	...	...	...	...	
Diabetes	...	...	..	...	1	...	1	...	2	...	
Anæmia, Chlorosis	1	...	...	..	...	...	...	1	1	...	
Other Constitutional Diseases	92	11	...	...	1	...	...	2	...	...	
Developmental											
Premature Birth	40	...	..	...	...	...	...	...	...	...	
Atelectasis	8	...	...	...	...	..	...	...	...	...	
Malformations	8	...	1	. .	...	...	...	...	...	...	
Age, Senile Decay	...	...	...	...	...	..	...	1	32	28	3
	236	94	35	22	47	23	30	24	47	30	3

Diseases.

Years.

	—1	5	15	25	35	45	55	65	75	85	x85
Brain Inflammation and Men ...	7...	8...	2...	2...	...	1...	1...	...	...	...	
Apoplexy, Paralysis	...	..	...	...	1...	4..	12...	21...	16...	6...	
Epilepsy	...	...	2...	3...	1...	4...	1...	2...	1...	...	
Convulsions	52 ..	5...	...	...	...	...	...	...	...	..	
Other Nervous Diseases ...	2 ..	...	...	...	...	1...	1...	...	1...	...	
DISEASES OF ORGANS OF—											
SPECIAL SENSE—Eye, Ear, Nose ..	..	...	1...	...	...	...	2...	...	...	...	
CIRCULATION—Pericarditis ...	...	...	1...	...	...	..	...	...	...	...	
Endocarditis...	...	...	...	1...	...	...	..	...	1...	...	
Valvular Disease	...	...	1...	3...	1...	3...	7...	11...	3...	...	
Other Heart Diseases ...	1...	...	1...	1...	4...	7...	17...	23...	21...	3...	
Aneurism	...	...	...	...	...	...	...	1...	...	...	
Thrombosis and Embolism	...	...	..	...	...	...	1 ..	...	...	...	
RESPIRATION — Laryngitis and Croup	...	7...	...	...	...	1...	...	...	...	...	
Asthma, Emphysema ...	...	...	...	...	...	...	1...	2 ..	3 .	...	
Bronchitis	29 ..	11...	1...	1...	1...	1...	6...	20...	18 .	4...	1
Pneumonia	43...	43...	3 ..	4...	6 ..	8...	19...	16...	12...	3...	
Pleurisy	...	...	...	1...	...	...	2...	1 ..	...	...	
Other Respiratory	2...	1...	...	1...	...	...	2...	1 ..	...	...	
DIGESTION—Teething ...	13...	3 ..	...	...	...	...	...	...	...	...	
Stomach Diseases	8...	4 ..	2	2 ..	1...	1 ..	3...	1...	2...	...	
Enteritis	13...	4 ..	..	...	1...	...	...	2...	...	...	
Intestinal Obstruction ...	2...	...	...	...	...	...	2 ..	1...	...	...	
Peritonitis	1...	...	1...	2...	2...	1...	1...	...	..	...	
Liver Diseases, Jaundice ...	1...	...	...	...	1 ..	4...	4 .	2 ..	...	...	
Other Digestive Diseases ...	4...	1...	...	...	...	1...	...	...	...	...	
GLAND ORGANS—Addison's Dis., Thyroid Dis. of uncertain use	...	...	...	...	...	1...	1 ..	...	...	...	
URINARY SYSTEM—Nephritis ...	1...	1...	1...	3 ..	1..	1...	1...	2...	...	...	
Bright's Disease	...	1...	1...	1...	1...	3...	3...	1...	...	...	
Bladder Disease	...	...	...	...	...	...	...	1...	...	...	
REPRODUCTIVE ORGANS—Male	...	...	...	...	...	1 ..	1...	...	1...	...	
Childbirth	...	...	...	3...	6...	9...	2...	...	...	...	
INTEGUMENTARY SYSTEM—Phlegmon		..	...	...	...	...	...	...	1...	..	
Accidental	7...	9...	5...	10...	8...	8...	6...	9...	2...	3..	
Suicide	...	...	...	3...	2...	2...	2...	...	1...	1...	
Dropsy	...	..	...	...	...	...	1...	...	...	...	
Tumor	...	1...	...	...	...	...	...	...	...	...	
Found Dead				One unknown age.					1...		
	186	99	22	41	38	62	99	117	83	20	1

Registered Workshops and Bakehouses.

Nature of Employment.	On Register.	*Persons Employed—*				Total.
		Domestic.	Men.	Women.	Young Persons.	
Tailoring	37	10	59	41	2	149
Dressmaking	97	30		174	120	421
Millinery	24	1		64	10	99
Bootmaking	35	14	61	10	7	127
Joinery	1		4			5
Sculptor	3		6			9
Blacksmith and Tinsmith . .	16	2	40		1	59
Saddler	4		14			18
Fishcuring	1		2	2		5
Plumbing	2		9			11
Beer Bottling	2		3	6	10	21
Brickworks	1		8	6		15
Flannel-weaving . .	1		2	1		4
Umbrella-maker . .	3	3	2	1		9
Bakehouses	85	39	113	24	3	264
	312	99	323	329	153	1216

In bringing to a close this review of the year's work, I take the opportunity to thank my fellow-officers for their co-operation and assistance.

I remain, Your obedient Servant.

D. J. THOMAS.

Cardiff and County Public Health Laboratory,
9 The Parade, Cardiff.

Report on Samples of Mussels and Cockles submitted by Dr. Thomas, M.O.H. for Merthyr Tydfil, showing their relative degree of Pollution.

On September 14th, 1903, a number of mussels collected in a sterile bottle was received for examination with special reference to their pollution by excrementitious material, and, if possible, for the isolation of the specific organism of Typhoid Fever. Evidence of the former was readily obtained, but of the latter, the results were uncertain, and necessitated a more prolonged examination. So far the question of the presence of the B. Typhosus must be answered in the negative.

Method.

Thirty mussels were examined in batches of ten. Ten mussels were taken as they were, *without their shells*, and shaken up in 90 cc of sterile water. After allowing the flask to stand ten minutes, the opalescent fluid that resulted was diluted still further, 10 cc being taken and added to a further 90 cc of sterile water, well shaken, and diluted again in the same manner. Then was thus obtained a series, representing dilutions 1 in 10, 1 in 100, and 1 in 1,000, and 1 cc used from the fluids for inoculation would correspond to ·1 cc, ·01 cc, and ·001 cc. It is clearly not unreasonable to decide in favour of human pollution if one thousandth of a cc yields the B.Coli, as no usual source of contamination under the circumstances in which these samples were collected could be other than from such origin.

Mussels.—Batch 1.

Treated as by the method described, the results may be tabulated as follows, the preliminary readings being taken on the second day after inoculation.

Date of inoculation, October 14th.

	Bile Salt Broth.	Sodium Carbonate Milk.	(Litmus) Nutrose Mannitol.
A. Dilution 1 in 10 ...	Gas and Acid 16/9 ...	Acid and Clot 16/9 ...	
B. ,, 1 in 100 ...	Gas and Acid ,, ...	Acid and Clot ,, ...	
C. ,, 1 in 1,000...	Gas and Acid ,, ...	Acid and Clot ,, ...	Acid and Clot.

Test for B.Enteritidis Sporogenes.

1 cc from A (*i.e.* one-tenth cc of undiluted)=No Enteritidis change in milk.

Conradi and Drigalski Surface Plates from Dilution A.

Plating out on Gelatine from :—

(1) Bile Salt dilution 1 in 1,000=B.Coli, Gas, Clot, and Indol.

(2) Sodium Carbonate Milk, in 1,000=Nearly all liquifiers, but also B.Coli, giving Gas, Clot, and Indol.

(3) Nutrose Mannitol yielded B.Coli, Gas, Clot, and Indol.

It will be seen that one thousandth of a cubic centi-metre from the washings of the Mussels gave the B.Coli, showing that there must have been at least a thousand per cubic centi-metre. Under the conditions in which the sample had been this may be said to have been of human origin.

Batch 2.

Mussels treated in the same way as the preceding.

	Bile Salt.	Sodium Carbonate Milk.	Nutrose Mannitol.
A. Dilution 1 in 10	Gas and Acid 16/9	Acid and Clot 16/9	
B. ,, 1 in 100	Gas and Acid ,,	Acid and Clot ,,	
C. ,, 1 in 1,000	Gas and Acid ,,	Acid and Clot ,,	Acid and Clot.

For B. Enteritidis Sporogenes.

1 cc from A. (*i.e.*, one-tenth cc of undiluted fluid) = No Enteritidis change in milk.

10 cc from A (*i.e.*, 1 cc of undiluted fluid) = Typical Enteritidis change in milk.

∵ At least 1 spore of B. Enteritidis, but less than 10 spores per cc.

Plating out on Gelatine from :—

(1) Sodium Carbonate Milk dilution 1 in 1,000. Yielded B. Coli, giving Gas, Clot, and Indol.

(2) Nutrose Mannitol dilution 1 in 1,000. This yielded *a Typical B. Coli,* which agglutinated with Typhoid-immune Serum, but which in certain of its reactions closely followed the B. Typhi, and in others the B. Coli, notably in its growth on potato, which was characteristic of B. Coli.

The presence of B. Enteritidis Sporogenes in 1 cc of the original fluid is strong evidence in favour of human pollution, in conjunction with the high relative abundance of B. Coli, such as is found in the preceding sample.

Batch 3.—*Mussels.*

	Bile Salt Broth.	Sodium Carbonate Milk.	Nutrose Mannitol.
A. Dilution 1 in 10	Gas and Acid 16/9	Acid and Clot 16/9	
B. Dilution 1 in 100	Gas and Acid ,,	Acid and Clot ,,	
C. Dilution 1 in 1,000	Gas and Acid ,,	Acid and Clot ,,	Acid and Clot.

For B. Enteritidis Sporogenes.

1 cc from Dilution A (*i.e.*, one-tenth cc of undiluted fluid) = No Enteritidis change.

10 cc from Dilution A (*i.e.*, 1 cc of undiluted fluid)=Typical Enteritidis change.

∵ At least 1 spore of B. Enteritidis, but less than 10 spores per cc.

Plating out on Gelatine from :—

Nutrose Mannitol (1 in 1,000): Yielded colonies like B. Coli, which were typical in one or more characteristics; absence of Indol formation in Broth or much-delayed clotting in milk.

The Conradi and Drigalski plates from Batch (1), Dilution A, yielded a typical B. Coli only.

The cockles submitted for examination were treated in the same way as the mussels.

Batch 1.

	Bile Salt Broth.	Sodium Carbonate Milk.	Nutrose Maninitol.
A. Dilution 1 in 10 ...	Gas and Acid 16/9 ...	Acid and Clot 16/9 ...	
B. ,, 1 in 100 ...	Gas and Acid ,, ...	Acid and Clot ,, ...	
C. ,, 1 in 1,000 ...	No change ,, ...	Acid and Clot ,, ...	Acid only.

For B. Enteritidis Sporogenes.

1 cc from A (*i.e.*, one-tenth cc of undiluted fluid)=No Enteritidis change.

10 cc from A (*i.e.*, 1 cc of undiluted fluid)=Typical Enteritidis change.

∵ At least one spore of B. Enteritidis, but less than 10 spores of B. Enteritidis.

Plating out on Gelatine from :—

(1) Sodium Carbonate Milk (1 in 1,000): Yielded B. Coli (Gas, Clot, and Indol).

(2) Nutrose Mannitol (1 in 1,000): The colonies sub-cultured were followed up in some detail. This organism is strongly a typical. Does not clot milk or form Indol, or form Gas in Glucose or Lactose; but the growth on potato is more like Coli, and intra-peritoneal inoculation is without fatal results. I may add that, morphologically, the organism resembles the B. Typhi, and that the agglutination reaction is positive in a dilution of 1 in 50. I have not come to a definite conclusion with regard to this organism, but at present I am inclined to think it is not the B. Typhi, but an extremely a typical B. Coli.

Batch 2.—*Cockles.*

	Bile Salt Broth.	Sodium Carbonate Milk.	Nutrose Mannitol.
A. Dilution 1 in 10 ...	Gas and Acid 16/9 ...	Acid and Clot 16/9 ...	
B. ,, 1 in 100 ...	Gas and Acid ,, ...	Acid and Clot ,, ...	
C. ,, 1 in 1,000 ...	No change ...	Acid and Clot ,, ...	Acid only

For B. Enteritidis Sporogenes.

1 cc from A Dilution (*i.e.*, one-tenth cc)=No Enteritidis change.

10 cc from A Dilution (*i.e.*, 1 cc of the original fluid)=A typical Enteritidis change.

Plating out on Gelatine from:—

(1) Nutrose Mannitol (1 in 1,000): Yielded Streptococci.
(2) Bile Salt (1 in 100 dilution): Yielded a typical B. Coli, which formed no Indol in Broth, clotted milk slowly, and gave a positive reaction with a Typhoid Serum at a dilution of 1 in 50 in 30 minutes.

Cockles.—Batch 3.

	Bile Salt Broth.	Sodium Carbonate Milk.	Nutrose Mannitol.
A. Dilution 1 in 10	Gas and Acid 16/9	Acid and Clot 16/9	
B. ,, 1 in 100	Gas and Acid ,,	Acid and Clot ,,	
C. ,, 1 in 1,000	Gas and Acid ,,	No change	Acid only

For B. Enteritidis Sporogenes.

1 cc from A (*i.e.*, one-tenth cc of undiluted fluid)=No Enteritidis change.

10 cc from A (*i.e.*, 1 cc of undiluted fluid)=No Enteritidis change.

Plating out on Gelatine from:—

(1) Bile Salt Broth (1 in 1,000): B. Coli Clot, Gas, and Indol.
(2) Nutrose Mannitol (1 in 1,000): Liquifiers on Gelatine in the main. No sub-cultures made.

Remarks:

The facts brought out by the bacteriological examination show that the cockles and mussels have been exposed to conditions which allow of serious contamination with human matter of excremental origin. The conclusion is quite clear that the sample of shell-fish submitted for examination is not of such a character as to be fit for human consumption.

With regard to the determination of the presence of B. Typhi, it will be seen that many organisms have in some degree approached that organism in its cultural and morphological characters, and the necessity of classifying such organism when a specific bacillus is searched for so as to make sure of the identity or non-identity of the two has occupied most of the time of this examination. I may say that I am following up some of these organisms, and, should they be eventually identified as being the B. Typhi, a report on such work will be forwarded you.

(Signed) H. A. SCHOLBERG.

October 2nd, 1903.

Joseph Williams and Sons, "Tyzt" Office, Glebeland, and 88 High Street, Merthyr.